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Enabling a Lower Carbon Future

2022 Climate Risk Report





Table of Contents

Letter from Our CEO	03
Executive Summary	04
Governance	06
Risk Management	09
Strategy	12
Metrics and Targets	20
Task Force on Climate-related Financial Disclosures Index	23
Forward-Looking Statements	24



Letter from Our CEO

At Chevron Phillips Chemical (CPCChem), we recognize that climate change is a pressing and worldwide concern. Our products generate many benefits to society, which we aim to enhance through our work to lower the carbon footprint of our operations and promote circularity in our products.

Including our stakeholders in how we are striving to manage climate change-related risks and opportunities is linked to the long-term prosperity of our company. We believe that working to reduce our carbon footprint is important to our success as a business and to our vision to be the premier chemical company. I am proud that we are taking the actions outlined in this report that address CPCChem's approach to the global climate challenge through improvements to our own operations and engagement across the value chain because we care about each other, our work, our customers and our communities.

Establishing new carbon targets

In 2022, CPCChem developed and established a target to reduce the carbon intensity of our operations 15% by 2030, relative to a 2020 baseline. The planned approach to achieving this target will require deployment of existing technologies in areas such as operational efficiencies, electrification, optimization of fuel gas systems and procurement of renewable electricity. We plan to source around one-third of our electricity demand from renewable sources for our operated assets to support our carbon intensity reductions.

-15% by 2030
Carbon Intensity

Taking action

Our climate strategy and programs set out objectives for addressing climate-related risks and opportunities we may encounter on the path to our carbon intensity target. Our climate strategy aims to enhance integration of climate-related considerations across our organization and includes strategic plans for achieving our emissions intensity target and building the resilience of our company.

Through our climate strategy, risk management approach and business planning processes, we believe our operations will be resilient and deliver long-term success for our company and for our stakeholders. This report discusses potential climate-related business implications and our unique positioning on the pathway to a lower carbon future. At CPCChem, we are proud of the products we create, which serve a beneficial role for our global society, and we aim to continue in our efforts to deliver value for all of our stakeholders.

A handwritten signature in black ink that reads "Bruce Chinn".

Bruce Chinn
President & CEO

Executive Summary



CPChem is proud to produce the chemicals that become everyday products

We are one of the world's top producers of olefins and polyolefins and a leading supplier of aromatics, alpha olefins, styrenics, specialty chemicals and polyethylene piping, producing the building blocks for more than 70,000 consumer and industrial products.

This **Climate Risk Report** outlines CPChem's planned approach to managing climate-related risks, actions to reduce greenhouse gas (GHG) emissions intensity and navigate energy transitions. In this report, we outline our governance, risk management, strategy and metrics. CPChem's **Climate Risk Report** provides our disclosures aligned with the framework developed by the Financial Stability Board's Task Force on Climate-Related Financial Disclosures (TCFD).

Robust Oversight

Our governance structure includes oversight of climate change-related risks and opportunities by CPChem's Board of Directors (Board) and direction and management by our Executive Leadership Team. At the executive level, our Leadership Team and Sustainability Executive Steering Team (EST) direct company strategies, risk management and the company's response to sustainability topics, including climate change. Highlighting our evolving focus on climate change, we created the Climate Guidance Review Team (GRT) to proactively identify, evaluate and manage potential risks and opportunities. The GRT is responsible for establishing and managing CPChem's climate strategy and related activities.



CPChem aims to take action in response to the global climate challenge through improvements to our own operations and engagement across our value chain.

Identifying and Mitigating Climate-Related Risk

CPChem considers potential climate-related risks across its operational strategy and planning. The nature of these risks depends on the physical aspects of climate change, market changes, development of regulations and the evolution of technological solutions. Through our Enterprise Risk Management (ERM) and strategic planning processes, we identify and put in place measures to mitigate major risks to our business, which include relevant climate-related transition and physical risks.

As part of our climate action planning efforts, we have conducted climate-specific scenario analyses to assess our business resilience utilizing scenarios developed by the International Energy Agency (IEA), Bloomberg New Energy Finance (BNEF) and the Intergovernmental Panel on Climate Change (IPCC). These analyses will inform decision making to help CPChem remain competitive and resilient in future environments.

Delivering for a Lower-Carbon Future

Our climate strategy aims to enable our long-term success and the continued delivery of chemicals and polymers that the world needs while seeking to lower our emissions intensity. Guided by our climate strategy, we aim to continue to institutionalize climate-related activities in our business. We are taking focused actions to (1) reduce greenhouse gas emissions and intensity, (2) invest in renewable energy and (3) improve climate risk resilience. As part of our broader sustainability strategy, we are taking actions to align with and make progress towards the United Nations Sustainable Development Goals (UN SDGs), particularly UN SDG 7, 12 and 13.

Accelerating Change

We are proud to produce chemicals and polymers that help improve lives around the world, including medical supplies, food packaging that can help reduce food waste, and lubricants that boost vehicle performance. We believe our products can support the advancement of the UN SDGs and global carbon reductions. We recognize that our continued success depends on navigating our company to succeed in a low-carbon world.

AIM TO REDUCE CARBON INTENSITY

Target 15% reduction in Scope 1 and Scope 2 GHG emissions intensity below 2020 levels

INVEST IN RENEWABLE ENERGY

Procure renewably sourced electricity to support carbon intensity reductions

IMPROVE CLIMATE RESILIENCE

Continue building resilience to physical and transition climate risks

Governance

Board Oversight

Our Board has a robust governance and risk management approach to oversee risks, including those related to climate change.

Our Board comprises eight representatives: three voting representatives each from Chevron U.S.A., Inc. and Phillips 66 Company and the Chief Executive Officer and the Chief Financial Officer of CPChem as non-voting representatives. Representatives from the Board serve on committees, providing strategic direction and input on ERM; Compensation; Environmental, Health, Safety and Security (EHSS); and other matters. The Board provides ultimate oversight for CPChem's risk management policies and procedures. This includes overseeing that CPChem has appropriate risk management systems to reasonably identify and address business, political, regulatory, environmental and other risks that might impact our company.

Climate change-related risks and opportunities are a consideration for the Board and are reviewed by the Board collectively. Board directors use information provided both through internal analysis and from external subject-matter experts (SMEs). The Board evaluates climate-related risks in the context of other business risks, including market, operational and reputational risks. Board committees support the work of the full Board through more in-depth assessments of potential climate risks.

The Board and its committees annually review CPChem's ERM process. ERM, which is discussed in more detail in this report, is a core process through which the Board and company leadership identify risks, including climate-related risks, to CPChem and ensure that appropriate mitigations of such risks are in place.



BOARD COMMITTEES OVERSEEING ASPECTS OF CLIMATE STRATEGY AND RISK

- **Operational Excellence Committee**

The Operational Excellence (OE) Committee's responsibility encompasses a wide variety of operations risk areas, described below in this report. In 2021, the OE Committee enhanced various aspects of environmental, health, safety and security risk management, including analysis of climate-related matters such as climate strategy, emissions control, global OE and manufacturing standard best practices and improvements, policy and facility resilience into its review process and meets regularly to discuss such risk

- **Board Audit Committee**

The Board Audit Committee (BAC), oversees CPChem's ERM process. This ERM process helps us identify and mitigate business risks, including climate change-related risks. The ERM process is repeated annually, and the results are reported up to the BAC.

Executive Oversight

Our Leadership Team directs company strategies, risk management and CPChem's response to sustainability topics, including climate change. The Leadership Team drives our business by assessing current performance and future opportunities, like our circular products portfolio.

The Leadership Team also oversees our ERM process that is being leveraged to support CPChem in addressing climate change-related risks.

Sustainability Executive Steering Team

In 2021, we assembled a Sustainability EST and established our first Vice President role devoted to sustainability to shepherd CPChem's sustainability objectives throughout the organization. The EST provides overall strategic guidance, support and oversight with respect to our sustainability strategy and associated programs, including those pertaining to climate. With decades of collective industry expertise, the EST is an informed and practical council, well-equipped to address sustainability issues identified as material to our business.

Executive Led Governance Teams

Reporting to the EST, two executive-led GRTs provide direction and recommendations on a variety of strategically important sustainability issues, specifically climate change and enhancing product sustainability and circularity. Our Climate and Product Sustainability and Circularity GRTs also provide a multidisciplinary view to manage and align sustainability and climate activities with the rest of the operational, commercial and functional priorities. CPChem's Environment, Health, Safety & Security Policy Committee, consisting of core Leadership Team members, provides oversight and governance for CPChem's EHSS activities and Operational Excellence (OE) Management System, which is our management system for many key sustainability issues, including those related to greenhouse gas emissions and facility resilience.

Climate Guidance Review Team

Our Climate GRT is responsible for identifying potential climate-related threats, risks and opportunities, as well as developing, recommending and overseeing the implementation of strategies related to climate matters.

Led by the Vice President of Sustainability and overseen by the Sustainability EST, the Climate GRT is a global team made up of cross-department managers, including EHSS, Research & Technology and Corporate Planning and Development. The Climate GRT may also engage with third parties or other experts and charter project teams to progress specific activities as needed.

The Climate GRT meets regularly to evaluate and assess climate matters and to develop the enterprise vision and short-, mid- and long-term strategies to manage risks.

Sustainability Executive Steering Team

Decision Executive

Justine Smith
SVP, Petrochemicals

Advisors

Benny Mermans
VP, Sustainability

Venki Chandrashekar
VP, Research & Technology

Members

Mitch Eichelberger
EVP, Polymers & Specialties

Elliott Johnson
SVP, EHSS

Bryan Canfield
SVP, Manufacturing

Tim Hill
SVP, Legal & Public Affairs

Steve Prusak
SVP, Corporate Planning & Technology



REFLECTIONS FROM OUR VP OF SUSTAINABILITY

Benny Mermans

Collaboration is needed to address the evolving climate challenge—perhaps one of the most complex challenges of our time. We seek to be part of global climate action, leveraging the energy of our workforce with clear leadership oversight to do our part.

Our Workforce

We will rely on the experiences and competencies of our diverse workforce to advance our climate strategy. Our Corporate Sustainability Group supports our three sustainability focus areas: climate change, product sustainability and circularity and social responsibility. In the last two years we have established new roles focused on climate strategy and GHG emissions management. Employees across the organization participate in workgroups supporting major objectives of our climate strategy. We believe our workforce is our most valuable asset to support the company's climate action plans and targets. Because of this, we have invested in providing educational resources around climate and GHG emissions to employees through different avenues, including internal podcasts and CPCChem's Sustainability Academy.



Risk Management

Identified Climate-Related Risks

Climate change-related risks are often classified into two main areas: physical risks and transition risks. Physical risks that could threaten our assets include flooding, extreme heat, hurricanes and water scarcity. Transition risks relate to the transition to a lower-carbon global economy and most commonly include policy and government actions, technology changes, market responses and reputational considerations. As part of our climate-action planning process, we identified relevant physical and transition risks and leveraged the findings to inform our climate strategy, programs and corporate ERM process. The paragraphs below highlight key climate-related risks we have identified.

Physical

We operate in diverse locations globally, with operated manufacturing facilities concentrated in the U.S. Gulf Coast region and non-operated joint venture facilities in the Middle East. We also operate facilities in Belgium, Singapore and across the United States.

We considered physical risks including potential impacts driven by both acute events and long-term climate pattern shifts in our operating regions. Relevant physical climate risks to our global operations include water stress, hurricanes, extreme heat and flooding. Some of these physical risks may be exacerbated by climate change. Potential physical risks could cause direct or indirect impacts to our assets and business operations.

For the full list of locations where we operate, please see our [Locations page of CPChem's website](#).

An analysis of our portfolio resilience under a hypothetical high global warming scenario is provided in the Climate Scenario Test section of this report.

We have robust practices in place to manage risks to our operations associated with the impacts of ambient conditions and extreme weather events. To manage risks related to relevant physical hazards, our OE framework for facility design includes project planning, phased gate execution and operational readiness practices. Large complex projects start with a team of SMEs, including project professionals, manufacturing, environmental, health and safety, process safety SMEs, project engineers, project managers and decision executives who collectively develop the project scope definition and objectives and begin identification of associated risks. As the project matures through the phases, risks are continually identified and assessed through this team, with the support of additional SMEs and third-party experts as necessary or appropriate. CPChem has continuing efforts to improve facility design and operations, and further strengthen the resilience of our facilities. For more information on our efforts to identify and mitigate physical climate change risks, please see our previous report [Managing Climate Change Risks: Safety and Planning for the Physical Risks of Climate Change](#).

Market

Analyses on the potential impacts of the energy transition on product demand and raw material are maturing with limited data sets. Decreased availability and/or increased production costs of fossil fuels could impact the availability and the prices of conventional feedstocks impacting production capacity and material costs. Conversely, higher production costs and increased demand from competitors and other sectors for low-carbon fuels might also impact fuel costs for CPChem compared to traditional fuel sources if we rely on those fuels to achieve carbon intensity reductions.

Potential consumer use of substitutes to CPChem's products that might be developed in the future could also impact our business. To navigate market risks, we closely monitor both short-term and long-term changes to supply and demand of feedstocks and products.

Through our ERM and business planning processes we are seeking to mitigate business risks and prudently invest for the long-term success of our company.

Policy and Regulatory

Changes in the regulatory environment, including those driven by climate-related issues, could affect our operations. For example, legislation, regulation and other government actions related to greenhouse gas emissions and climate change could increase CPChem's operational costs and impact demand for CPChem's products. We attribute our climate policy and regulatory risk to three priority topics: upstream regulation of oil and gas, carbon pricing mechanisms and increased regulation of end markets. Regulations that limit the geographies where oil and gas may be extracted or that increase the costs of extraction (permitting, site assessment, etc.) could decrease oil and gas production and impact CPChem's margins on downstream products, such as polyethylene. Similarly, carbon pricing mechanisms, such as carbon taxes or cap and trade systems, could increase CPChem's costs of direct emissions and the costs of feedstocks or other materials where carbon prices are passed through by suppliers. Additionally, regulations on downstream uses of CPChem's products, such as plastic or bottle taxes or single-use plastic bans, could decrease demand for CPChem's products. CPChem actively monitors regulatory and legislative changes which might impact supply, demand or other changes.



Reputation

Global focus on climate change, the energy transition and plastic waste might impact our business. Similarly, increased stakeholder pressure on the chemicals sector could impact capital investments, as well as increase reporting and data collection requirements. We work to manage reputation-related risks through engagement with stakeholders and monitoring of key issues.

Technology

We believe the development of emerging technologies in pursuit of a lower-carbon economy could present unique challenges and risks, as well as opportunities to the companies in the chemical sector that deploy these technologies on existing and new assets. Some technologies might be feasible to incorporate this decade, while others require significant development. We have instituted a technology watch program to evaluate the impact of these evolving technologies for relevance and feasibility.

Identifying and Assessing Risk

Through our business planning and enterprise risk management processes, we seek to identify and reduce risks to drive long-term business sustainability. To identify our climate risks, we leverage groups of SMEs, including members of our Sustainability Group and Climate Guidance Review Team to

ascertain potential risks for assessment through our ERM process. Identified risks are then assessed for their frequency and business impact which informs risk prioritization. Similarly, we assess mitigations in place so that we can consider both the mitigated and unmitigated risks.

Corporate oversight of the ERM process includes an annual risk review with executive leadership and the Board, through the BAC. As part of this review, the BAC evaluates business risks and their potential consequences. Members of our Climate GRT and Product Sustainability and Circularity GRT participate in preparation for the BAC reviews.

We use a risk management software to standardize our approach and to create better reporting methods.

Operational Excellence System

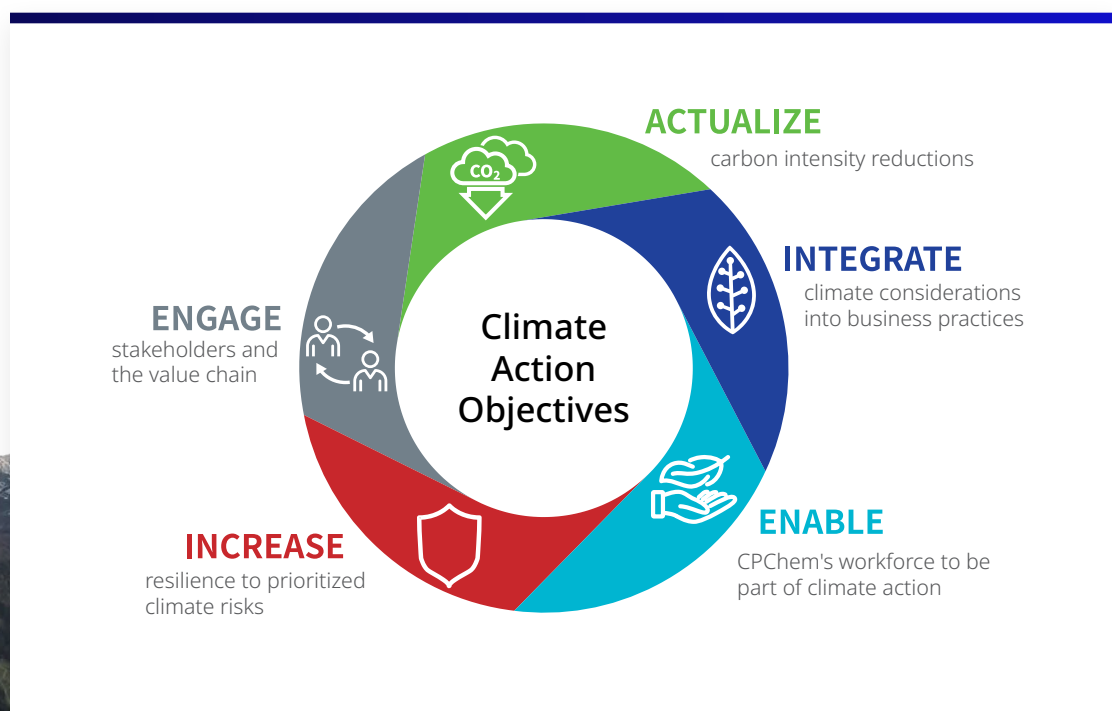
To approach risk management in a consistent manner across our various geographies and locations, we use our Operational Excellence Management System (OEMS). OEMS provides a global framework that aims to help standardize our efforts, continuously improve and raise the level of operational discipline. The EHSS Policy Committee, consisting of core Leadership Team members, provides oversight and governance for our OEMS.

Strategy

At CPChem, we are taking action to help address the global climate challenge through improvements to our own operations and engagement across our value chain. We recognize that climate change is a global issue that presents new challenges and opportunities to our business and therefore are striving to address these in our strategic priorities and business planning.

Climate Action and Risk Management

Climate change is a focus area within CPChem's sustainability strategy and a critical component of Our Journey to Zero, our EHSS strategy blueprint. We undertake a climate action planning process to guide the company's efforts and climate-related programs. Informed by our climate action planning process, we plan to enhance existing business processes or establish new processes to support the execution of our climate strategy and specific climate action objectives. Continuous review and adaptation of our climate strategy is a responsibility of our Climate GRT and is important to the continued success of our business.



Strategic Business Processes: Enabling Action

We will rely on critical annual processes to integrate climate considerations in our business.

Our business planning processes are designed to enable CPChem to consider long-term fundamentals and potential risks as part of pragmatic decision making. Guided by our climate strategy, we have prescribed activities to further enhance these processes so that CPChem can continue to deliver value to its stakeholders in a lower-carbon future.

Strategic planning

Annual strategy development is informed by signposts as well as energy and economic outlooks across a range of possible futures that take into consideration many variables, including climate-specific variables.

MACC

(Marginal Abatement Cost Curve)

The process by which we identify, prioritize and fund greenhouse gas emission-reduction projects.

Enterprise Risk Management

The process by which we identify, monitor and manage risks to our facilities and enterprise, including climate-related risks.

Annual budget

Sustainability is currently a project type within our capital budget classification to enable identification of capital allocation primarily driven by sustainability considerations.

CAPPS

(Critical Assessment of Project Pipeline Strategy)

CAPPS is an important process to ensure CPChem has a healthy pipeline of capital projects, including climate-related opportunities and investments.



Strategic Planning

We undertake both short- and long-term business planning, including conducting periodic scenario planning exercises to support future strategic decision making.

While developing scenarios, consideration is given to the outlook for variables in several categories, which could have climate implications, including regulatory and policy, geopolitical, energy transition, alternative feedstock, demand and market preference and investor mandates and capital market drivers. By using scenario planning to determine the “realm of plausible” future operating environments, we can challenge our internal views and assess how our business can remain resilient in any environment. This also allows us to periodically assess whether the speed and scope of the changing operating environment warrants modification of our existing action plans.

Sustainability Considerations in Project Planning

Sustainability is a category within our capital budget, and sustainability impacts of capital projects are expected to be considered as part of project stage gate decisions. Our CAPPS process incorporates sustainability considerations and can serve as a platform for ideation of climate-related opportunities and investments.

We leverage an annual MACC process to prioritize GHG emission-reduction projects. Projects may be submitted for funding through the MACC process that were generated during targeted MACC assessments at facilities, CAPPS or even through bottom-up ideation from CPChem facilities. The use of our MACC process allows us to make strategic portfolio decisions on project funding that support our targets and pursue the most cost-effective solutions across our facilities.

Our Strategy to Address Transition Risks

A primary objective of CPChem’s climate strategy is to enable the organization to continue managing evolving transition risks, including market, policy and regulatory, technology and reputation risks.

Life Cycle Assessments and Portfolio Sustainability Assessments

As part of our efforts to optimize our product portfolio and produce life-enriching products, we have accelerated our efforts to perform Life Cycle Assessments (LCA) and Portfolio Sustainability Assessments (PSA) on the company’s current products. CPChem’s Accelerated LCA/PSA Guidance Review Team, an internal group of subject-matter experts, is responsible for the strategy and implementation of LCA and PSA projects. Once completed, LCAs and PSAs will help our business and customers better understand the economic, environmental and social impacts of our products.

Forecasting Market Demand and Consumer Expectations

As part of developing our business plans, we consider market risks, opportunities and mitigations, including the future demand in the different geographies in which we might operate, the competitive landscape and the potential value proposition.

We manage market risks with long-term demand outlooks and commodity-pricing forecasts. To assess our competitive position and growth opportunities, we also incorporate external perspectives in the development of projection models to stress-test. CPChem’s track record of growing low-cost feedstock investments and manufacturing innovation further reduces risks toward a resilient future for our assets.

Collaborating with Policymakers and Legislators

We monitor regulations in the countries where we conduct business, including regulations driven by climate-related issues that could affect our operations. We determine appropriate actions and address these risks. Examples include upstream



regulation of oil and gas, carbon pricing mechanisms, recycle content mandates and increased regulation of end markets.

We systematically identify legislative and regulatory activities that might impact our business and CPChem's sustainability strategy. We believe the chemical industry and policymakers can work cooperatively to help address the potential impacts of climate change by developing a balanced approach that supports emissions reductions, advances increased energy efficiencies and recognizes the critical role chemical products play in enabling a lower carbon future.

Within the plastics industry, regulations continue to shift the landscape. We are positioning our business to meet evolving regulations on end-uses of plastic products, and are actively engaged with stakeholders to promote pragmatic solutions to enable a circular economy.

Proactively Mitigating Carbon Pricing Risks

We recognize the importance of considering potential future carbon costs in our investment process. Although only a small share of our assets is currently exposed to carbon pricing, we recognize regulators are continuing to evolve carbon pricing schemes and that some of our assets may be subject to more widespread and higher carbon pricing in the future.

To address the risk of carbon pricing and to plan for a potential lower carbon future, we plan to take steps to mitigate our exposure. The most impactful action is reducing our carbon intensity—now and in the future. CPChem's focus on advantaged feedstocks, such as ethane, has positioned our ethylene assets to produce ethylene at a lower carbon intensity than naphtha cracking assets. Further, our focus on energy efficiency, sourcing of electricity and steam from cogeneration assets, as well as reduced reliance on coal for energy needs, has strategically positioned our assets to succeed in a low carbon environment in the short-term. See more on our efforts to lower emissions intensity in the Metrics and Targets section of this report.



Advancing a Circular Economy

We believe circular economy solutions will play a critical role in global decarbonization and we expect the demand for circular products to continue to outpace production for the foreseeable future. CPChem is the first company in the U.S. to announce commercial-scale production of circular polyethylene, including an annual production target of 1 billion pounds of Marlex® Anew™ Circular Polyethylene by 2030. CPChem is collaborating with a range of stakeholders to grow its circular product portfolio and enhance the safety and environmental performance of the circular value chain. In addition, CPChem backs numerous initiatives intended to reduce plastic waste in the environment.



Innovating Climate Technology

Our engineering and technology organizations enable CPChem to stay at the forefront of new technology by evaluating and developing new solutions, including innovative climate-related technologies. Additionally, CPChem has created a Climate Technology Team to explore and evaluate innovative technologies for carbon reduction strategies. This team evaluates existing and emerging GHG reduction solutions and how those solutions could be integrated into current and future assets. CPChem has a successful history of supporting innovation through research and development and partnering with universities and technology providers in areas such as decarbonization, alternative energy and the circular economy. Some of our areas of exploration include evaluating the potential for electric furnaces, evaluating carbon capture solutions, investing in projects that reduce flaring and evaluating fuel switching opportunities. This focus on climate technologies will enable us to remain an industry leader and lower the carbon intensity of our products.

Addressing Stakeholder Priorities

We understand that increasing public attention to climate change matters might impact our business. We engage with stakeholders to receive feedback on sustainability-related issues. In 2020, we identified key environmental, social and governance issues relevant to the business through a rigorous materiality assessment that was leveraged to inform updates to our Sustainability Focus Areas. Community Advisory Panels are another example of an engagement platform that helps us understand the needs of our local communities and respond appropriately. Community Advisory Panels in the areas we operate typically meet monthly and represent a diverse subset of the local communities, providing a two-way avenue for communication regarding the safe and responsible operation of our facilities. These are examples of avenues in which feedback is leveraged to enable CPChem's programs to address the needs and concerns of our stakeholders.

Climate Scenario Test

Assessing the Resilience of Our Business

We use scenarios and a range of long-term fundamentals to regularly test our portfolio and business strategy. We also conduct targeted climate-scenario analyses to challenge our internal views on potential business impacts of certain potential physical and transition risks.

This process included using publicly available climate and circularity scenarios, including scenarios that forecast net-zero emissions by 2050 and that model potential pathways to an advanced circular economy. To inform our assessment of exposure to physical risks, we use the IPCC representative concentration pathways. The results of these assessments informed our climate strategy, programs and 2022 enterprise risk management processes.

Transition Scenarios and Analysis

We used the IEA energy-transition scenarios as the basis for testing how potential climate-related risks and opportunities might impact CPChem under different emissions trajectories, while Bloomberg New Energy Finance (BNEF) circularity scenarios were used to review potential plastic risk implications under a world of increasing circularity. These scenarios are hypothetical constructs that use assumptions and estimates to highlight central elements of a possible future and are not forecasts, predictions or sensitivity analyses.

Carbon Pricing Risks

A central theme in future climate scenarios is the institutionalization of a carbon price, varying by region. Under the IEA SDS and NZE scenarios, carbon pricing is expected to be implemented in CPChem operating regions. Carbon prices in the scenarios range from \$120–\$130 per metric ton in 2030, ramping up to \$200–\$250 per metric ton in 2050. Based on emissions from industry today, this would represent a significant increase in direct cost to companies, including CPChem. CPChem's operated Scope 1 emissions in 2021 were 4.7 million metric tons. Our MACC process is an institutionalized program that is one avenue used to limit the exposure of CPChem to carbon pricing risks by incorporating carbon pricing into emission-reduction project funding decisions. Other processes to proactively limit carbon price exposure risk are detailed throughout this report.

Climate and Circularity Transition Scenarios

IEA Sustainable Development Scenario (SDS) - 1.65°C warming

An 'ambitious' world in which there is a major transformation of the global energy system

IEA Net Zero Scenario (NZE) - 1.5°C warming

A 'Net zero' world in which there is a major transformation to reduce carbon intensity

BNEF Increased Recycling Scenario (IR)

Under the improved recycling scenarios, production using virgin feedstock-based materials is reduced when compared to the business as usual (BAU) case

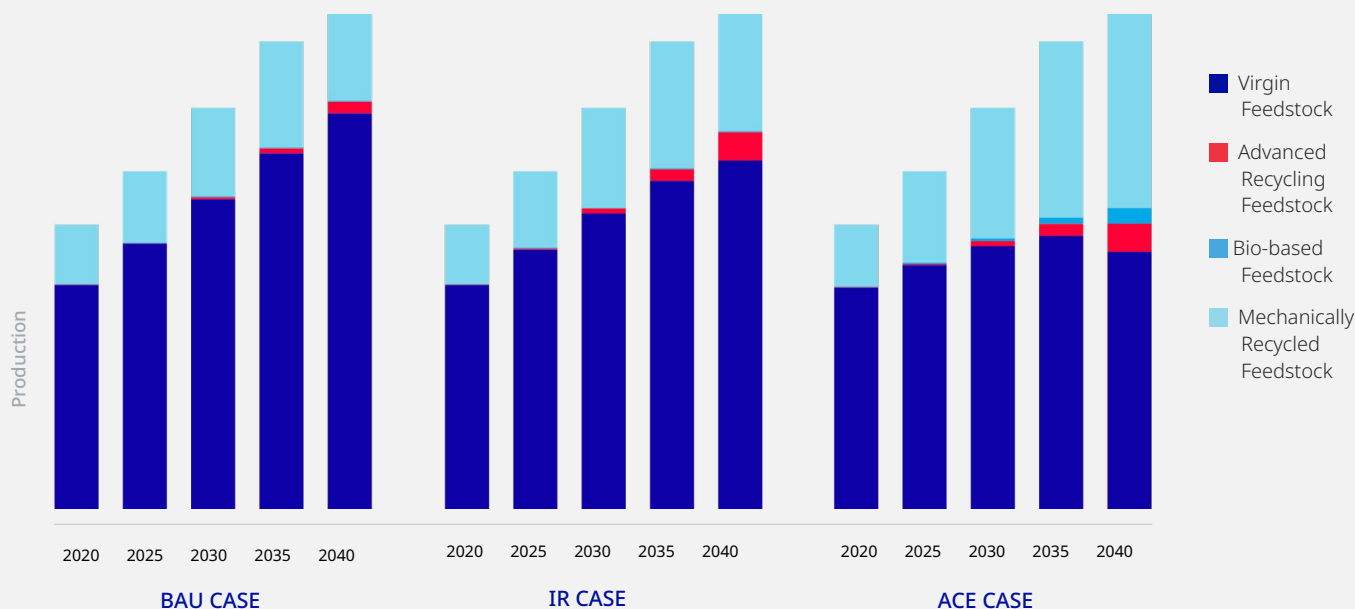
BNEF Advanced Circular Economy Scenario (ACE)

Each material pathway is assessed under a different 'high-circularity' pathway

Energy Pricing Risks

The IEA's SDS and NZE scenarios model crude oil and natural gas prices significantly declining from now through 2050. CPChem's variable costs are reliant on ethane prices, which are dependent on natural gas prices. Global polyethylene prices are dependent on Asian naphtha cash costs, which trend with crude prices. Together, these moving prices affect the overall polyethylene chain margin. CPChem considers the impacts of these prices for the IEA scenarios as well as for internally generated scenarios on our overall margins to assess the risk to our business in various scenarios. Our strategy considers results from scenario analysis and aims to mitigate risks of plausible scenarios, including, but not limited to, our efforts to diversify feedstocks.

GLOBAL POLYETHYLENE PRODUCTION



Bloomberg BNEF May 5, 2020, Circular Economy Series, CPChem

Plastic Business Model Resilience

We expect that a lower carbon future will rely on polyethylene to deliver high-efficiency, high-quality products that meet end-market requirements from a growing middle class at a competitive price. BNEF circularity scenarios were used to test our business resilience in an environment with increased regulation of end-markets, higher levels of substitution of existing markets, increased stakeholder expectations and circular technology investment challenges.

Each of the BNEF scenario models demonstrate an increased demand growth, a potential indication of CPChem's assets long-term resilience under multiple market conditions. In each of the BAU, IR and ACE scenarios, virgin polyethylene maintains the largest portion of market share while polyethylene demand from mechanically recycled feedstock continues to grow significantly between now and 2040. In the ACE, polyethylene produced from bio-based and advanced recycling feedstock takes a modest portion of reactor volume compared to virgin and mechanically recycled feedstock-based polyethylene; however, the growth in these markets is significant.

To meet the increasing demand for plastics and assist with the marketplace's transition to a lower-carbon circular world, CPChem is working to expand its circular product portfolio, while continuing to produce cost-effective products for its customers. To maintain a path of successful growth, CPChem's business projections and outlook incorporate circularity considerations. We are also investing in companies with specialized expertise in recycling to support a circular economy for plastics.

Read more in CPChem's [2021 Sustainability Report](#)

Physical Risk Scenarios and Analysis

Using the scenario narrative, we screened for physical risks and identified flooding, water stress, hurricanes and extreme temperatures to be risks which are most salient to CPChem's assets. Climate models and third-party tools were used to consider probability of exposure and frequency of events. This information informed directional financial impact assessments based on potential damages, losses and business interruption from the different risks under the high-global warming scenario.

Overall, as a result of this analysis, we 1) identified the potential hazards that are most relevant to CPChem's assets; 2) identified the facilities most exposed to potential physical risks; and 3) further informed our strategy to mitigate climate-related risks.

Exposure to Physical Risks

According to the analysis, most of CPChem's physical risk results from acute exposure to hurricanes and associated flooding at high-value assets in the US Gulf Coast region, as they are associated with higher asset-damage levels and longer business interruption during extreme weather events. In the RCP 7 scenario², hurricanes are not expected to increase in frequency³ but are expected to have higher wind speeds and longer interruption times due to heavier rainfall leading to an increase in potential annualized impact compared to our baseline risk. However, most sites with current flood risk actually see projections for lower inundation levels leading to a reduction in potential annualized impact in a high global warming scenario compared to our baseline risk.

Additional chronic physical risks include extreme heat and water stress, which are both modeled to increase from baseline in a high-global warming scenario. Extreme heat conditions are modeled³ to occur at several CPChem sites with increasing global temperatures. According to public models, the percentage of days annually that exceed the historical

Physical Climate Risk Scenarios

IPCC RCP 7

Represents the medium-to-high end of the range of future emissions and warming.

IPCC RCP 8.5

Represents a "business as usual" outcome, in which society makes little concerted effort to reduce greenhouse gas emissions.

90th percentile temperature for that date could increase on average 25% from baseline across our facilities by 2050. Extreme heat conditions could lead to reduced production at our existing assets due to limitations of process cooling equipment.

Water stress is an emerging physical risk that could have a greater impact to CPChem compared to baseline, as drought and water stress conditions are expected to increase on the U.S. Gulf Coast as a result of rising global temperatures (see image below). Although difficult to quantify, increased water stress could lead to higher water costs, lack of access to water and, potentially, increased costs to treat water (e.g., reverse osmosis and desalination).

As part of our climate action efforts, we plan to further develop our understanding of and mitigations for risks that are modeled to be increasing from the respective baseline risk in a high-global warming scenario, including, but not limited to, water stress.

1. IPCC Sixth Assessment Report, pages 238-239.

2. RCP 7 is aligned with TCFD's recommendation to "stress test" a portfolio of assets for "business as usual" temperature change conditions that represent little effort to mitigate against the physical impacts of climate change. Under RCP 7, chronic risks from extreme heat and water stress begin to take effect, and risks from coastal flooding and hurricanes increase in magnitude.

3. Projections from Knutson et al 2020 (National Oceanic and Atmospheric Administration).

4. Coupled Model Intercomparison Project Phase 6 (CMIP6) (World Climate Research Programme)

Metrics and Targets

-15% by **2030**
Carbon Intensity

CPChem is taking steps to reduce its carbon intensity and working across its value chain to deploy solutions that enable a lower carbon future.

Targets

CPChem assets achieve a lower baseline GHG emissions intensity compared to its peers¹ at 0.44 tonnes of CO₂e/tonne of product due to its fleet location, cracking of light feedstocks and focus on energy efficiencies. We have established a 2030 target to reduce our operated Scope 1 and Scope 2 carbon intensity by 15% from this 2020 baseline. CPChem's operated carbon intensity is defined as the total greenhouse gas emissions from operated assets, direct emissions and indirect emissions associated with imported electricity and steam, per metric ton of production from the assets included. It is expected that our success in achieving our targets will rely on a combination of projects at our facilities, the purchasing and deployment of electricity from renewable sources and the start-up of less carbon intensive assets. To support our target to reduce our carbon intensity, we plan to source around one-third of our electricity demand from renewable sources for our operated assets.

CPChem's target was developed through a diligent review of the technologies and opportunities that are reasonably expected to be available to the company between now and 2030. The remainder of this section of the report details the metrics used to track our progress toward our targets, our current performance and our efforts to actualize lower emissions intensity opportunities.

Metrics

CPChem tracks and reports emissions across its facilities on both an operated and equity basis. We track and report on a variety of climate-related metrics, including, but not limited to, direct and indirect emissions, the GHG emissions intensity of our operations (Scope 1 and 2), energy use and freshwater use.

We aim to align our greenhouse gas reporting and data management practices with global frameworks, such as the [GHG Protocol](#). In early 2022, CPChem used a third party to complete a detailed review of its GHG inventory. CPChem is also undertaking efforts to continue to improve the traceability and accuracy of its GHG emissions data through digitization tools and publishing of internal standards. In 2022, CPChem created its first GHG reporting Operational Excellence standard aimed at standardizing the responsibilities, requirements and procedures for CPChem's GHG reporting and data management practices.

Our company is also developing an internal tool to track greenhouse gas emissions, energy use and water data back to their sources. These efforts support our ability to provide employees and stakeholders with timely and relevant updates on the organization's progress and impacts. We are committed to enhancing how we measure progress and sharing information with employees to further align the company and create a more cohesive workforce.

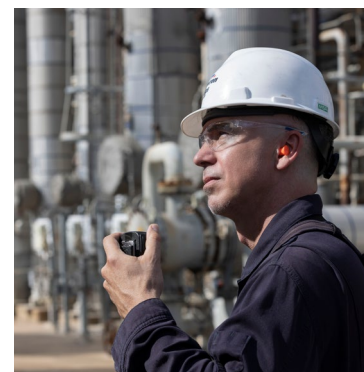
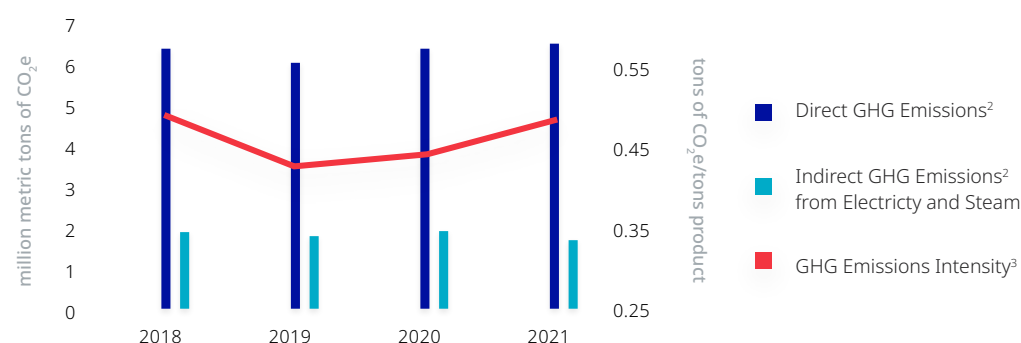
1. Based on publicly available 2020 GHG Emissions intensities published by CPChem peer companies.

GHG Emissions Performance

In 2021, CPChem's operated GHG emissions were 6.5 million metric tons, while its equity GHG emissions were 9.5 million metric tons. In alignment with the GHG Protocol, we report GHG emissions on both an operated and equity basis. Operated emissions represent a 100% stake of emissions from wholly owned or joint venture operations that are operated by CPChem, while equity emissions represent wholly owned operations and the equity stake of emissions for facilities in which CPChem has only partial equity ownership.

The majority of CPChem's Scope 1 emissions result from the combustion of fuels in ethylene furnaces and steam boilers and from flaring. Ethylene furnaces produce a hydrogen-rich byproduct stream that is often blended with supplemental natural gas and used as fuel, and these furnaces are still the largest contributors to CPChem's GHG footprint. CPChem is working to lower emissions associated with combustion.

OPERATED GHG EMISSIONS



More than 15% of our total GHG emissions are derived from the purchase of third party-generated electricity, a Scope 2 emission and the leading source of GHG emissions from our polyethylene assets. We anticipate that our third-party electricity providers will continue to expand their use of renewable energy and natural gas to further reduce the emissions associated with producing grid electricity, alongside our own efforts to procure renewably sourced electricity.

CPChem's operated GHG emissions intensity was 0.48 tons CO₂e/tons product produced in 2021, a slight increase compared to our 2020 baseline GHG emissions intensity. GHG emissions and intensities vary with plant production, outages, turnarounds and maintenance.

GREENHOUSE GAS EMISSIONS AND INTENSITY

	2018	2019	2020	2021
Total Direct (Scope 1) and Indirect (Scope 2) GHG Emissions Equity Share ¹ (million metric tons of CO ₂ e)	9.4	8.9	9.3	9.5
Direct GHG emissions (Scope 1)	7.1	6.7	6.9	7.2
Indirect GHG emissions from electricity and steam (Scope 2)	2.4	2.3	2.5	2.4
Total Direct (Scope 1) and Indirect (Scope 2) GHG Emissions Operated ² (million metric tons of CO ₂ e)	6.4	6.1	6.4	6.5
Direct GHG emissions (Scope 1)	4.6	4.3	4.5	4.7
Indirect GHG emissions from electricity and steam (Scope 2)	1.9	1.8	1.9	1.7
GHG Emissions Intensity ³ (ton CO ₂ e/ton product)	0.49	0.43	0.44	0.48

1. GHG emissions reported on an equity basis represent wholly owned operations and the equity stake for facilities where CPChem has only partial equity ownership, with the exception of owner operations in Borger, Texas, as well as a 100% stake reported for a CPChem operated owner-owned facility in Old Ocean, Texas. Totals are rounded to the nearest hundred thousand ton.

2. GHG emissions reported on an operated basis represent 100% stake for wholly owned and joint venture operations which are operated by CPChem. Totals are rounded to the nearest hundred thousand ton.

3. GHG emissions intensity, also referred to simply as "carbon intensity" in this report, is reported on an operated basis and represents 100% stake for wholly owned and joint venture operations which are operated by CPChem. GHG Intensity is the ratio of the greenhouse gases emitted (tons of CO₂e) divided by the products produced (tons of product).

Actualizing Reductions

CPChem works across our assets to cost-effectively lower emissions intensity in line with our corporate strategy. We leverage a MACC process to systematically identify and prioritize emissions reduction projects across our portfolio. This process includes assessments designed to uncover a diverse array of both short- and long-term carbon reduction opportunities on existing assets. Types of opportunities assessed and pursued across our portfolio include:

Renewable energy

We aim to optimize on-site solar energy installations to provide cost-effective and reliable power to our facilities while also working to source renewables from other strategic locations. In addition to solar energy, we are exploring how CPChem can leverage other alternative clean energy sources.

Fuel switching

We are evaluating fuel switching opportunities for both short- and long-term emissions reductions. Hydrogen already represents a large portion of the fuel gas used for combustion at our ethylene facilities; however, we are exploring opportunities to optimize these streams in the short-term to further lower emissions.

Hydrogen

We are working to further advance hydrogen firing opportunities through strategic partnerships and by investing in demonstration projects and technologies. For example, CPChem is evaluating a lower CO₂ emissions furnace that can fire high concentrations of hydrogen (up to 100%) to produce ethylene at a lower emissions rate compared to furnaces fired using traditional methane rich fuel gas or natural gas streams.

Flare management

Although flaring only represents approximately 10% of CPChem's total GHG emissions, flaring reductions are expected to contribute to our 2030 carbon intensity reductions. We expect to implement flare management projects, prioritized through our MACC process. We are also installing a flare gas recovery unit at our largest facility in Texas to reduce emissions from flaring.

Energy efficiency improvements

CPChem has a long-standing Energy Best Practice Team that is focused on tracking and seeking out efforts to improve energy performance through energy reduction projects or operational efficiencies. Energy coordinators routinely meet to share best practices, celebrate successes and challenge each other to creatively meet companywide energy plans and targets. Further enhancements to energy efficiencies at our sites, specifically within our ethylene assets, will contribute to cost-effective carbon intensity reductions.

Lower carbon growth

We are also pursuing carbon intensity reductions through the energy and emissions efficient design of growth projects. For example, the Golden Triangle Polymers plant, a recently announced joint venture between CPChem and QatarEnergy in Orange, Texas, is targeting to have approximately 25% lower greenhouse gas emissions than similar facilities in the United States and Europe.

Task Force on Climate-Related Financial Disclosures Index

We are committed to regularly updating our stakeholders on our climate change risk management, governance and performance. 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		Disclosure	Location
Governance			
Disclose the organization's governance around climate-related risks and opportunities.	(a) Describe the organization's governance around climate-related risks and opportunities.	Board oversight	Board Oversight
	(b) Describe management's role in assessing and managing climate-related risks and opportunities.	Executive management of climate risks	Executive Oversight
Strategy			
Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's business, strategy and financial planning where such information is material.	(a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long terms.	Strategic business planning processes	Climate Action and Risk Management
	(b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	Business planning	Strategic Planning
		Project planning	Sustainability Considerations in Project Planning
		Financial planning	Forecasting Market Demand and Consumer Expectations
	(c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2° C or lower scenario.	Assessing the resilience of our business	Climate Scenario Test
Risk Management			
Disclose how the organization identifies, assesses and manages climate-related risks.	(a) Describe the organization's processes for identifying and assessing climate-related risks.	Physical Risk	Risk Management: Physical
		Transition Risk	Risk Management: Market, Policy and Regulatory, Reputation, Technology
	(b) Describe the organization's processes for managing climate-related risks.	Physical Risk	Risk Management: Physical
		Transition Risk	Risk Management: Market, Policy and Regulatory, Reputation, Technology
	(c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	Risk Management	Identifying and Assessing Risk
	Metrics and Targets		
Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.	(a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	Targets	Targets
	(b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 GHG emissions and the related risks.	Scope 1 and Scope 2	Metrics: GHG Emissions
	(c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	Targets	Targets

Forward-Looking Statements

Certain statements in this document are forward-looking statements that are subject to risks and uncertainties. These statements are not guarantees of future performance or programs. The actual development, implementation or continuation of any program, policy, initiative, target or related activity discussed in this report, may differ materially in the future. Words or phrases such as “plans”, “aims”, “may”, “could”, “seeks”, “targets”, “strategies”, “opportunities”, “pursues”, “will” and similar expressions are intended to identify forward-looking statements. These statements are not guarantees of future performance and actual outcomes and results may differ, perhaps materially, from what is expressed herein. Analyses and forward-looking statements relating to the operations of Chevron Phillips Chemical are based on management’s expectations, estimates and projections, their interests and the chemical industry in general on the date this report was prepared. Actual results could differ materially, based on a number of uncertainties, factors and risks (collectively, “the Risks”), many of which are outside the control of Chevron Phillips Chemical and its affiliates, employees, directors, or officers. Recipients of this information are cautioned not to rely on these forward-looking statements. Chevron Phillips Chemical undertakes no obligation to update or revise any forward-looking statement, whether as a result of new information, future events, or otherwise.

Many of the standards, metrics and frameworks used in preparing this report continue to evolve. Changes to such standards, metrics and frameworks could cause results to differ, perhaps materially from those indicated in this report. The statements of intention in this report are relevant only as of the date of publication of this report and CPChem undertakes no obligation to update these statements.

The scenario analyses summarized in this report are also based upon various assumptions regarding uncertain future factors and events and leverage information from third parties, such as, the Internal Energy Agency, Intergovernmental Panel on Climate Change and Bloomberg New Energy Finance. Scenarios referenced and their outcomes, relating to the operations of Chevron Phillips Chemical are based on third party data and scenarios (and the assumptions upon which such third party data and analyses are based) which may be of limited availability and uncertain quality on the date the analyses were conducted. CPChem makes no representation or warranty as to the third party information contained within these scenarios. These analyses and outcomes are not guarantees of future performance, are not necessarily indicative of CPChem’s views and the actual results may differ, perhaps materially, from what is expressed herein.



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