



LIFE CYCLE ASSESSMENT AND BENEFITS OF EXXONMOBIL PRODUCTS

ExxonMobil is committed to helping society reduce overall greenhouse gas emissions by decreasing the Company's emissions and developing and deploying emission-reducing technologies and products. Increasing the supply of products with lower life-cycle greenhouse gas emissions enables the transition from higher-emission alternatives.

To evaluate ExxonMobil's impact on society's overall greenhouse gas emissions, including Scope 3 emissions, it is critical to consider society's essential needs, available alternatives and the emissions created or avoided throughout a product's life cycle in meeting those needs. This holistic approach provides a better assessment of overall emissions and improves customers, stakeholders and policy makers understanding of ExxonMobil's efforts to thoughtfully reduce global emissions while meeting society's essential needs.

ExxonMobil used this approach⁽⁴⁾ to analyze the change in overall emissions associated with the Company's business plans. On this basis, ExxonMobil's full life-cycle absolute greenhouse gas emissions for its oil, natural gas, fuels (including biofuels), chemicals, and lubricants portfolio could decrease by about 12% in 2030 relative to 2016 levels. Similarly, ExxonMobil's portfolio life-cycle emissions intensity (g CO₂e/MJ) could decrease by about 4% in 2030 relative to 2016. The decrease in absolute emissions and emissions intensity is a result of continued improvement in greenhouse gas performance of existing operations, optimization of the asset portfolio and product mix, with a growth in LNG, chemical products, lubricants, and lower-emissions fuels that help customers reduce their emissions.

For products that lack practical short-term alternatives, constraining ExxonMobil's production to reduce the Company's Scope 3 emissions simply transfers that production and associated emissions to another supplier. This would increase overall emissions if production shifts to a less-efficient, higher-emission operator. For more than two decades, ExxonMobil refineries have focused on energy efficiency and lower emissions. As a result, today the emissions intensity (Scope 1 and 2) of ExxonMobil refineries is more than 15% lower on Carbon Emissions Intensity (the equivalent of about 5 million metric tons per year CO₂e based on ExxonMobil refining throughput in 2020) than the global industry average⁽⁵⁾.

ExxonMobil has publicly reported the Company's Scope 1 and Scope 2 greenhouse gas emissions data for many years and more recently began providing Scope 3 estimates (See data table on Page 48).

Reporting Scope 1 emissions data (direct greenhouse gas emissions from Company operations) can provide useful insight into the efficiency and emission-reduction performance of the Company's operations, portfolio of products, and resource types.

Reporting Scope 2 emissions data (indirect greenhouse gas emissions from energy purchased by the Company) highlights the Company's choice of electricity purchased to power its operations.

Scope 3 emissions primarily refer to the indirect emissions resulting from society's need for and use of the Company's products.

To illustrate this concept, the Company modeled⁽⁶⁾ the greenhouse gas benefit of substituting unabated LNG for unabated coal for generating power in a market such as India. The analysis concluded that more than 100 million metric tons of greenhouse gas emissions per year could be avoided if all of ExxonMobil's projected 2030 LNG production displaced coal in power generation. Similar benefits can also be expected in other industry sectors utilizing coal.

In the U.S., fuel switching from coal to natural gas led to a 14% reduction in greenhouse gas emissions from 1995 to 2020⁽⁷⁾. More recently in Europe, shortfalls in lower-carbon sources of energy, including natural gas, resulted in increased coal use and higher emissions.

Another example of ExxonMobil's products reducing emissions versus alternatives is in the transportation sector. The Company's projected 2030⁽⁸⁾ renewable fuel production could avoid more than 25 million metric tons per year of greenhouse gas emissions by displacing a corresponding amount of conventional fuel refined from crude oil.

In the chemical sector, a study⁽⁹⁾ concluded that plastic packaging in the United States helped society avoid life-cycle greenhouse gas emissions versus turning to alternatives as a group. In terms of 2030 ExxonMobil volumes into U.S. plastic packaging, that calculation⁽¹⁰⁾ would equate to approximately 13 million metric tons per year of U.S. enabled avoided emissions. If applied globally, our plastics could enable approximately 40 million metric tons per year of avoided emissions⁽¹¹⁾.

In addition to packaging applications, the use of plastics is growing in a variety of other applications that improve modern life such as cell phones, electric vehicles, wind turbine blades, medical devices, food preservation, agriculture, and shipping and distribution. Lightweight plastic also reduces the weight of vehicles, which is especially important in electric vehicles to improve battery performance and range. In internal combustion engine vehicles, every 10% reduction in vehicle weight improves fuel economy by 6-8%, which reduces greenhouse gas emissions accordingly.⁽¹²⁾