Methodologies and Definitions

Greenhouse Gas Emissions

Of the six Kyoto Protocol GHG emissions, the GHG emissions most relevant to Pioneer are carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O). These GHG emissions are the basis for our GHG inventory and emission-reduction targets, reported in terms of CO_2e. In addition to these GHG emissions, combustion and venting are sources of other emission constituents; volatile organic compounds (VOCs), nitrogen oxide (NOx), sulfur dioxide (SOx) air emissions and particulate matter (PM) are also considered in the management of emissions in our upstream oil and gas operations.

Direct GHG Emissions (Scope 1)

These emissions are from sources that are owned or controlled by Pioneer, for example, emissions from combustion in owned or controlled equipment and emissions from oil and gas production in owned or controlled process equipment. Pioneer's GHG emissions inventory and emissions reduction targets include Scope 1 emissions under our operational control.

Electricity Indirect GHG Emissions (Scope 2)

Emissions from the generation of purchased electricity consumed by Pioneer are Scope 2 emissions. Purchased electricity is bought or otherwise brought into the organizational boundary of the company. Scope 2 emissions physically occur at the facility where the electricity is generated. Pioneer GHG emissions inventory and emissions targets include location-based Scope 2 emissions for electricity purchased to power facilities and equipment under our operational control.

Other Indirect GHG Emissions (Scope 3)

These emissions are a consequence of company activities but occur from sources not owned or controlled by Pioneer. Examples include processing of sold products and end use of sold oil and gas.

GHG Emissions Reporting

As a U.S. onshore company, the entirety of Pioneer's Scope 1 and 2 emissions falls within the regulatory jurisdiction of the U.S. Environmental Protection Agency (EPA). The program prescribes methodologies to quantify GHG emissions for each emission source category, including methane. Although the EPA GHG Reporting Program is comprehensive for the oil and gas industry, the reporting of certain emissions may not be required In our GHG reporting. We provide data on non-reportable Scope 1 emissions and include indirect (Scope 2) emissions. The development of our corporate GHG inventory was based on both the U.S. EPA GHG Reporting Program (GHGRP) requirements, The GHG Protocol, and the IPIECA/American Petroleum Association (API)/International Association of Oil and Gas Producers "Petroleum Industry Guidelines for Reporting Greenhouse Gas Emissions."

Pioneer Scope 3 emissions are quantified using an operational control approach consistent with Scope 1 and 2 accounting and follow The GHG Protocol reporting guidelines.

The operational control approach allows Pioneer to capture the vast majority of GHG emissions that also closely parallel GHG emissions calculated for EPA GHGRP Subpart W. With operational control, Pioneer can influence/organize activity data and resulting emissions from within the company structure for a robust GHG emissions inventory.

Lack of standardization in emissions calculation methodologies can lead to variability in emissions inventories reported by oil and gas operators. While we present a corporate inventory that is more representative of our actual emissions, for comparability purposes, we will continue to provide details regarding our emissions as reported to the EPA GHGRP in our Sustainability Performance Data Table.

Target Definitions

- GHG emissions intensity performance will be based on Scope 1 and 2 GHG emissions divided by gross oil and gas production [tonnes carbon dioxide equivalent (CO_2e)/thousand barrels of oil equivalent (MBOE)].
- Methane emissions intensity performance will be based on:
    - Methane emissions in terms of CO_2e divided by gross oil and gas production (tonnes CO_2e/MBOE)
    - Methane emissions in terms of mcf divided by gross gas production (Mcf/Mcf)
- Flaring intensity performance will be based on natural gas volumes flared during production operations, divided by gross natural gas production (Mcf/Mcf).

We recognize that EPA GHG Reporting Program methodologies are typically based on engineering estimates and emissions factors. To better align actual emissions with those reported through the EPA GHGRP, Pioneer is engaged in efforts to study and quantify emissions in actual field settings.

Methodologies and Definitions

For years, Pioneer has participated in academic research projects to improve quantification of emissions from various production equipment and activities. Through our internal methane detection program, we are also gathering data to better understand the rates and distribution of fugitive emissions in our operations, which are not quantified in this report. In 2023, we joined the Oil and Gas Methane Partnership 2.0, an initiative to foster measurement-informed emissions inventories. The results of this work could result in changes in the methodology of EPA GHG Reporting and the levels of the GHG and methane reported by the company. More detail on these initiatives can be found in the Monitoring, Reporting and Verification section of Chapter 5: Emissions Management.

Our emissions forecasting for planning purposes is also dependent upon publicly available information (e.g., fuel mix forecast for the ERCOT electrical grid). Should our assumptions throughout this process need to change, we will adjust our forecasting and goals as necessary.

Water

Recycled Water: Tier 1

Recycled water, also referred to as treated produced water, is naturally occurring water extracted through the production process that is then processed for storage and use in hydraulic fracturing. Produced water is generally a mixture of water, naturally occurring dissolved solids, and a small number of products used in the oil and gas production process. Like brackish water, produced water is a very high-salinity water source. Advanced hydraulic fracturing technology and water processing methods have allowed produced water to become a viable alternative water source. As a Tier 1 source, recycled water use will continue to grow as water demand increases.

Reclaimed Municipal Water: Tier 2

Reclaimed water is treated effluent water (municipal wastewater) that is specifically authorized for reuse by Texas Commission on Environmental Quality (TCEQ). As a Tier 2 source, reclaimed water is both cost-effective and reliable.

Brackish Water: Tier 3

Brackish water reservoirs that contain water too high in salinity – greater than 3,000 mg/L total dissolved solids (TDS) – for drinking or agricultural use are an important oil and gas water resource in the Permian Basin. As a Tier 3 resource, brackish water reservoirs will continue to contribute to Pioneer's water portfolio and freshwater reduction targets.

Freshwater: Tier 4

While many other operators define freshwater as less than 1,000 mg/L TDS or less than 2,000 mg/L TDS, Pioneer defines freshwater using a more stringent standard of less than 3,000 mg/L TDS. While we recognize the 1,000 mg/L TDS is sometimes suitable, this limit does not realistically capture how water is used in the Permian Basin. Much of this area depends on lower quality water sources (1,000 to 3,000 mg/L TDS) for local consumption for agricultural irrigation, and ranching.

Total Dissolved Solids (TDS)

Total Dissolved Solids (TDS) refers to the total mineral content of the water and is a standard way to measure water quality.