

How Does Oregon Account for Agricultural Greenhouse Gas Emissions and Removals?

Oregon inventories greenhouse gas (GHG) emissions, removals, and storage using various tools and approaches:

- The Oregon Department of Environmental Quality (DEQ) tracks GHG emissions from fossil fuel combustion and economic activities through the Sector-Based Inventory (SBI).
- The Oregon Department of Energy (ODOE), through the Land-based Net Carbon Inventory (LCI), will track the balance of GHG emissions and removals—also known as net carbon flux—occurring on Oregon’s natural and working lands.
- Separately, DEQ completes a consumption-based inventory, which this factsheet does not cover because the scope and methodology differ significantly from those used by the two other approaches.

More information about the consumption-based inventory can be found [here](#).

DEQ’s Sector-Based Inventory tracks GHG emissions such as carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases (F-gases¹), produced within Oregon by economic sector, such as industrial and transportation sectors, and emissions associated with all the electricity used in Oregon. It’s generated by integrating data from DEQ’s Greenhouse Gas Reporting Program and the State Inventory Tool produced by the U.S. Environmental Protection Agency’s (EPA). The tool is used to track Oregon’s sector-based emissions over time. ([View the Sector-Based Inventory](#) and the activities it tracks.)

ODOE will also generate its Land-based Net Carbon Inventory using EPA-approved methods. It will track net carbon flux of carbon dioxide, methane, and nitrous oxide resulting from land use, land use change, forestry, and other disturbances (e.g., wildfire) on Oregon’s natural and working lands. It will track the net carbon flux over time and be used to inform state climate goals related to carbon sequestration and storage on Oregon’s lands. ([Learn more about the Land-based Net Carbon Inventory in Factsheet No. 2.](#))

1: Fluorinated gases (F-gases) are gases with a fluorine component that have a high global warming potential. They are emitted almost entirely from human-related activities, such as from use as refrigerants and in industrial processes like semiconductor manufacturing.

The Agriculture Sector/Cropland Land Use Category

DEQ and ODOE provide separate inventories of GHG emissions and removals across Oregon's economic sectors and natural and working lands, respectively. Agriculture appears as a sector in the DEQ's Sector-Based Inventory while cropland appears as a land use category in the ODOE's Land-based Net Carbon Inventory. The inventories account for separate activities occurring in the agricultural sector on cropland and do not double-count GHG emissions.

Tracking in the Sector-Based Inventory

The Sector-Based Inventory tracks emissions (but not removals) from specific agricultural management activities over time (Table 1). For example, [urea application and liming of soils](#) produce carbon dioxide. Similarly, all forms of livestock and their manure produce methane. Fertilizer application increases nitrous oxide emissions from soils. Agricultural residue burning produces carbon dioxide, methane, and nitrous oxide, but only methane and nitrous oxide are tracked because carbon dioxide is assumed to be removed by crops planted in the next year.

Table 1. Agriculture emissions tracked by DEQ's Sector-Based Inventory.

Agriculture Emissions Tracked	Sub-Category
Carbon dioxide (CO ₂)	a) Urea Fertilization b) Liming of Agricultural Soils
Methane (CH ₄)	a) Enteric Fermentation b) Manure Management c) Agricultural Residue Burning
Nitrous oxide (N ₂ O)	a) Agricultural Soil Management b) Manure Management c) Agricultural Residue Burning

Tracking in the Land-based Net Carbon Inventory

The Land-based Net Carbon Inventory will track net carbon flux on Oregon's cropland over time. It will not track emissions already tracked by DEQ. Instead, it will focus on net carbon flux related to activities that the EPA categorizes as land use and land use change. These include net carbon flux from the conversion of other land use categories such as grassland to cropland, and from the conversion of cropland to other land use categories. It will also track methane and nitrous oxide emissions from wildfires on cropland.

The Land-based Net Carbon Inventory follows EPA guidance for accounting for net carbon flux on cropland, which are based on a standardized GHG accounting framework created by the Intergovernmental Panel on Climate Change (IPCC). The IPCC refers to major sources of GHG emissions as "key categories." ODOE will track net carbon flux from as many key categories as methods, data, and expertise allow (Table 2).

Table 2. Modified Intergovernmental Panel on Climate Change (IPCC) Reporting Categories table indicating sources of cropland emissions and removals to be tracked by ODOE's LCI¹.

IPCC Key Category Name	Code Sub-Category Name
<i>3B1 Forest Land</i>	3B1bi Cropland converted to Forest Land
<i>3B2 Cropland</i>	3B2a Cropland remaining Cropland 3B2bi–3B2bv All Other Lands converted to Cropland
<i>3B3 Grassland</i>	3B3bii Cropland converted to Grassland
<i>3B4 Wetland</i>	3B4bii Land converted to Flooded Land 3B4biii Land converted to Other Wetland
<i>3B5 Settlement</i>	3B5bii Cropland converted to Settlement
<i>3B6 Other Land</i>	3B6bii Cropland converted to Other Land
<i>3C Aggregate Sources and Non-CO₂ Emissions on Land</i>	3C1d Biomass burning on All Other Lands (e.g., wildfires)

Key Resources

1: https://www.ipcc-nggip.iges.or.jp/2019rf/pdf/1_Volume1/19R_V1_Ch04_MethodChoice.pdf