



2016 EMISSIONS INVENTORY FROM LANDSIDE ACTIVITIES

JUNE 2018

MDOT MPA Terminals

MDOT
MARYLAND DEPARTMENT
OF TRANSPORTATION

MARYLAND PORT
ADMINISTRATION



2016 EMISSIONS INVENTORY FROM LANDSIDE ACTIVITIES

MDOT MPA Terminals

The Maryland Department of Transportation Maryland Port Administration (MDOT MPA) is committed to reducing air emissions at the MDOT MPA public terminals at the Port of Baltimore. MDOT MPA works closely with its tenants, port users, regulatory agencies, and communities to identify and implement air emission reduction strategies for cargo-related operations. The first step in the process is to develop air emission inventories (EI) for landside activities, which have been completed for calendar years 2012 and 2016. The next EI is scheduled for 2020.

MDOT MPA's 2012 and 2016 EIs were comprehensive inventories of landside, cargo-related activities, including the following: cargo handling equipment (CHE), heavy-duty diesel vehicles (HDDVs; i.e., trucks), rail, and mobile cargo such as automobiles and roll-on/roll-off equipment. Pollutants for which emissions were quantified include the greenhouse gas carbon dioxide (CO₂) and the following criteria air pollutants: carbon monoxide (CO), nitrous oxides (NO_x), particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂), and volatile organic chemicals (VOCs). These EIs provide a current picture of landside, cargo-related air emissions generated at the state-owned terminals and can be used to determine and measure emission-reduction strategies.

Between 2012 and 2016, the cargo throughput increased by 10%. During that same time, total emissions of pollutants have reduced on average by 19%, except for CO₂, which increased by 7% (Figure 1). CO₂ emissions, solely a function of fuel consumption,

increased with the rise in cargo throughput between 2012 and 2016. Emissions of other pollutants are a function of fuel type and emission controls on engines. Newer engines generally have more robust emission controls.

A commonly used metric for evaluating changes in emissions is to calculate emissions per ton of cargo handled. Between 2012 and 2016, total emissions per ton of cargo handled decreased by an average of 23% for all pollutants, including CO₂ (Figure 2). These reductions are attributed to newer trucks servicing the terminals, modernization of CHE, and improved operational efficiency at the terminals.

Emission reductions per ton of cargo and equipment upgrades/usage between 2012 and 2016 are as follows. **CHE** (Figure 3): Emissions for all pollutants decreased between 4% (CO₂) and 50% (SO₂). **HDDVs (Trucks)** (Figure 4): Emissions for all pollutants decreased between 7% (PM₁₀) and 26% (SO₂). **Terminal tractors** (Figure 5): The number of Tier 4 diesel engines increased from 11 to 50, while usage of Tier 4 diesel engines increased from 5% to 47%. **Forklifts and Toploaders** (Figure 6): The number of unregulated diesel engines decreased from 19 to 8, while usage of LPG, electric, and Tier 4 diesel units increased from 21% to 38%.

MDOT MPA will continue to work with its partners and stakeholders to develop and implement programs and install innovative technologies that improve air quality.

Figure 1. MDOT MPA Terminals
 Changes in Total Landside Emissions (2012-2016)

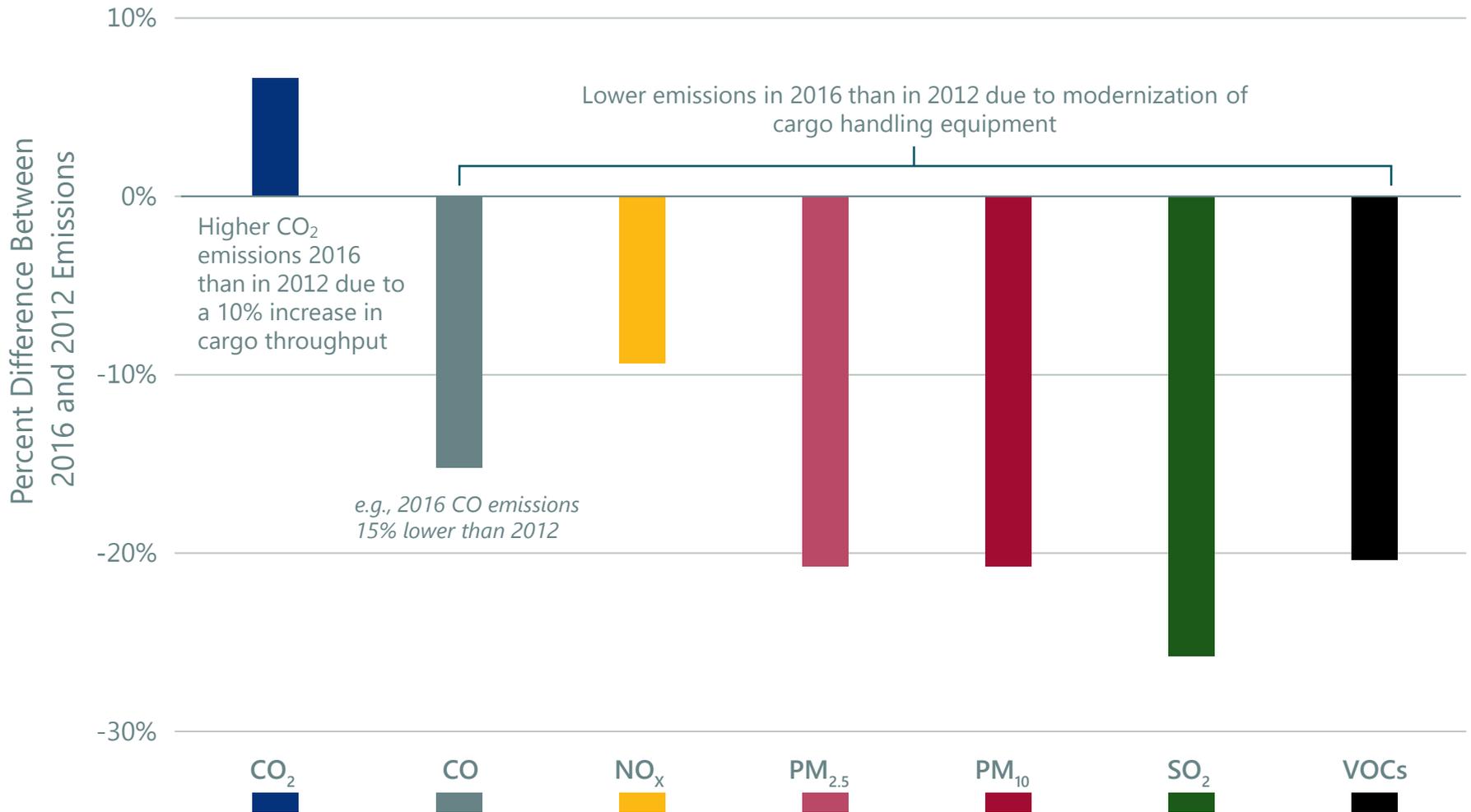


Figure 2. MDOT MPA Terminals Changes in Total Landside Emissions Per Ton of Cargo Handled (2012-2016)

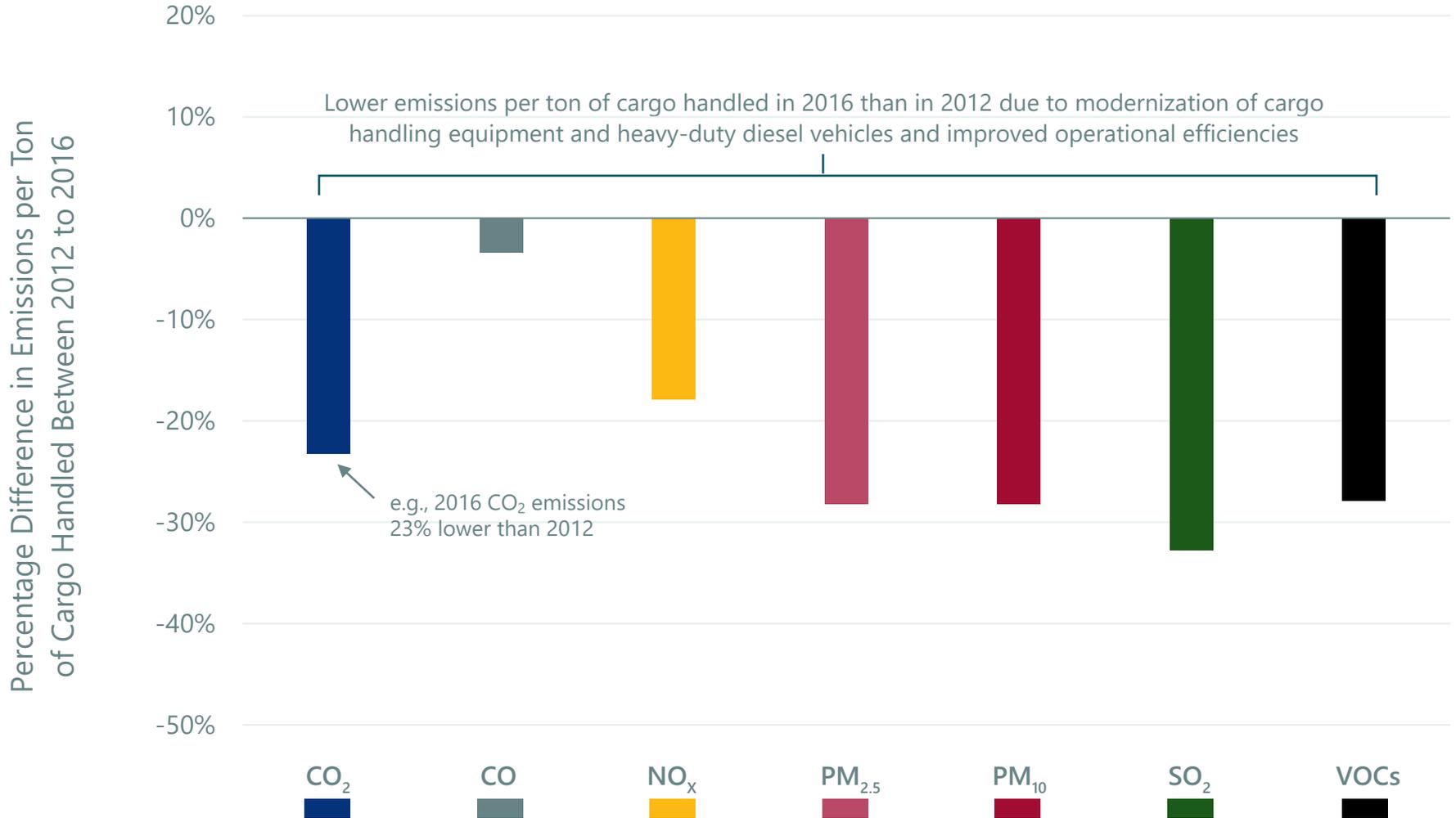


Figure 3. MDOT MPA Terminals
 Changes in Cargo Handling Equipment Emissions
 per Ton of Cargo Handled (2012-2016)

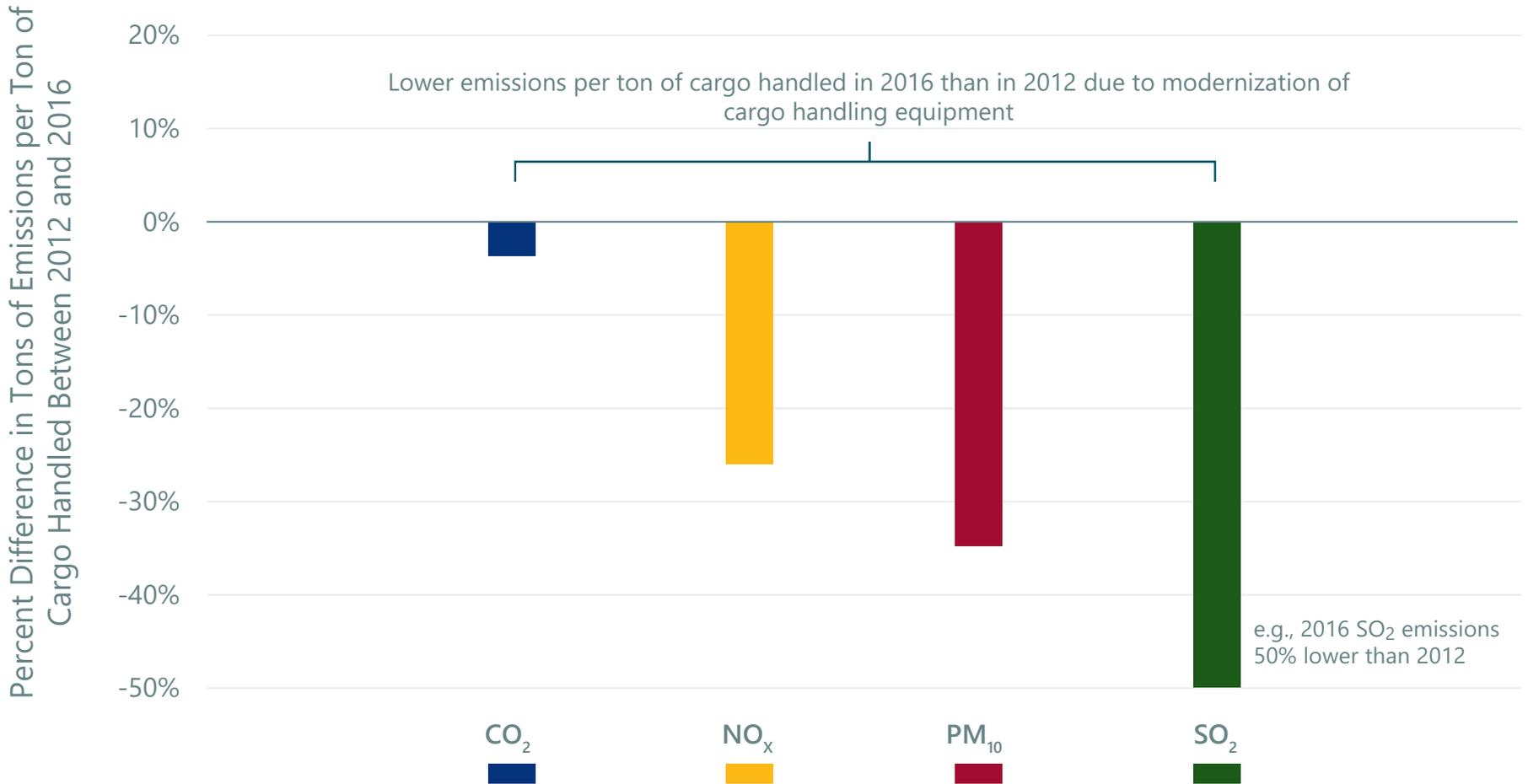


Figure 4. MDOT MPA Terminals
 Changes in Truck Emissions per Ton of Cargo Handled
 (2012-2016)

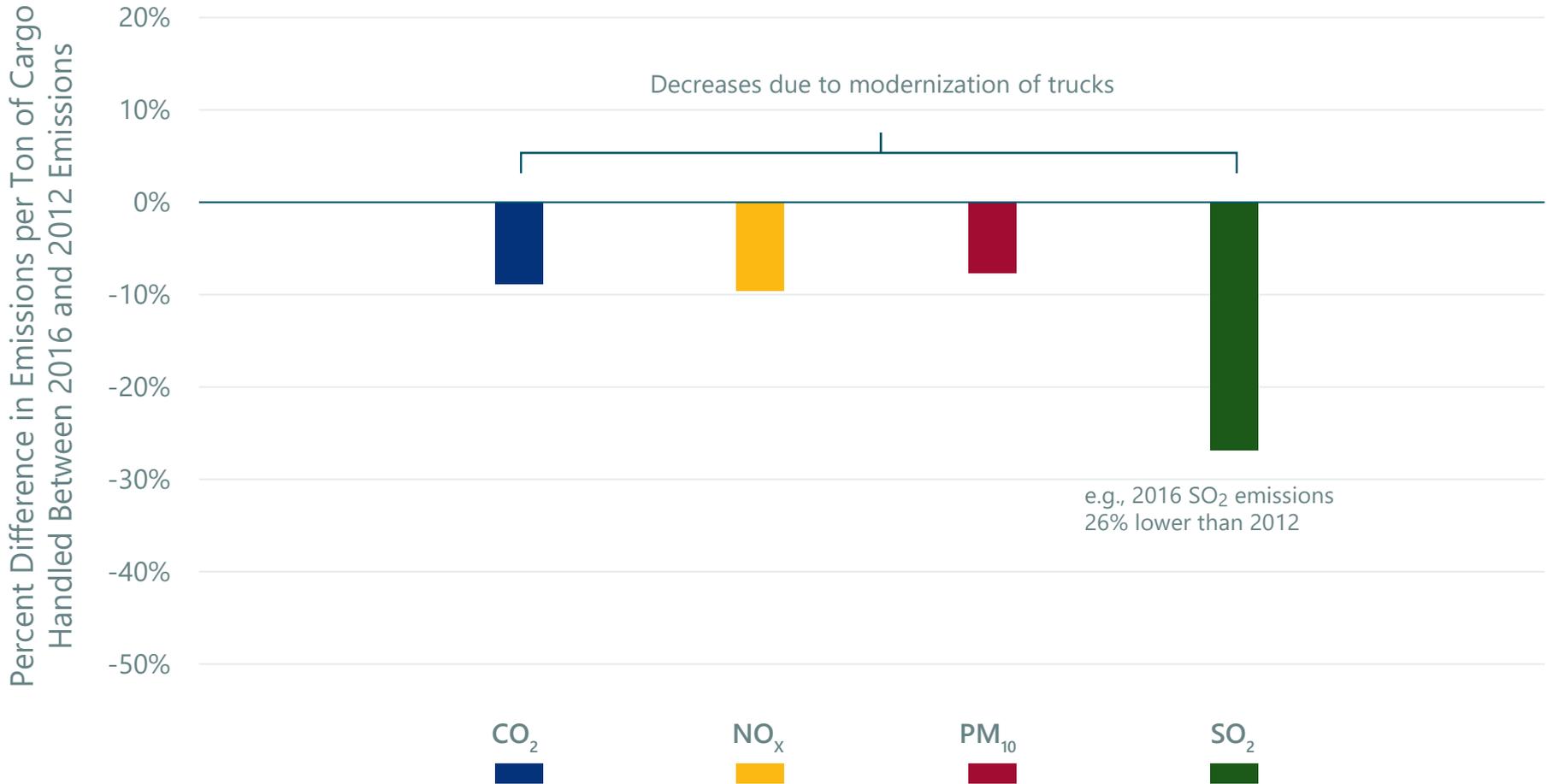


Figure 5. MDOT MPA Terminals
 Modernization of Cargo Handling Equipment
 (2012-2016)

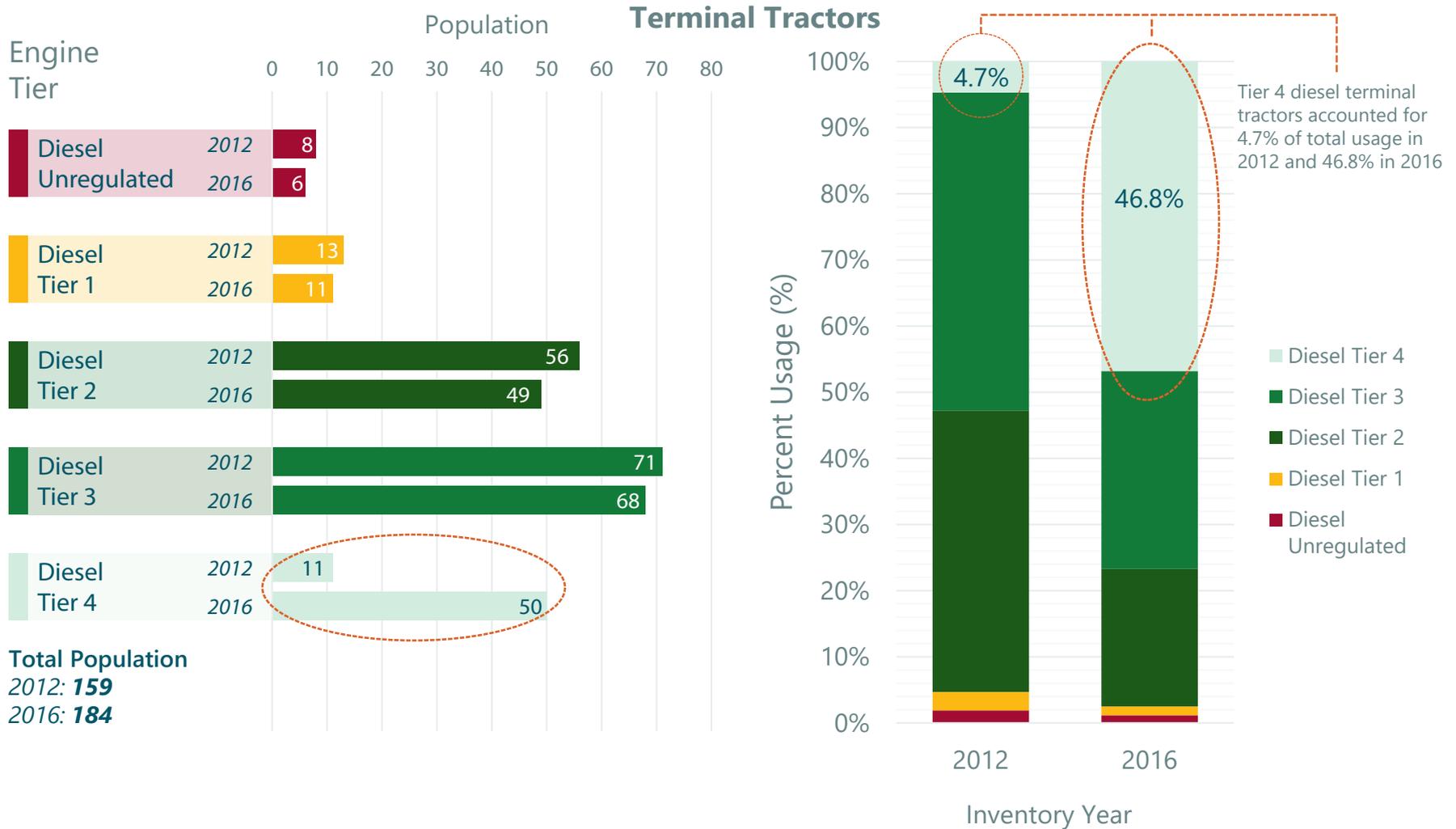
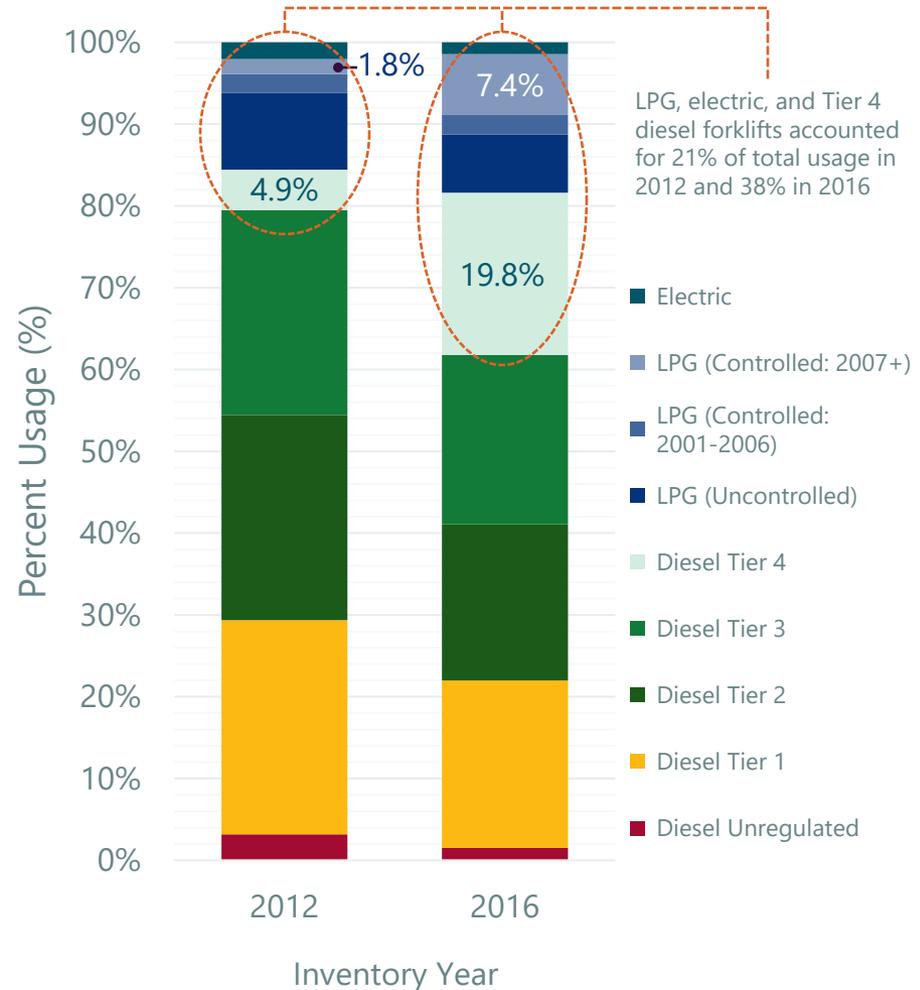
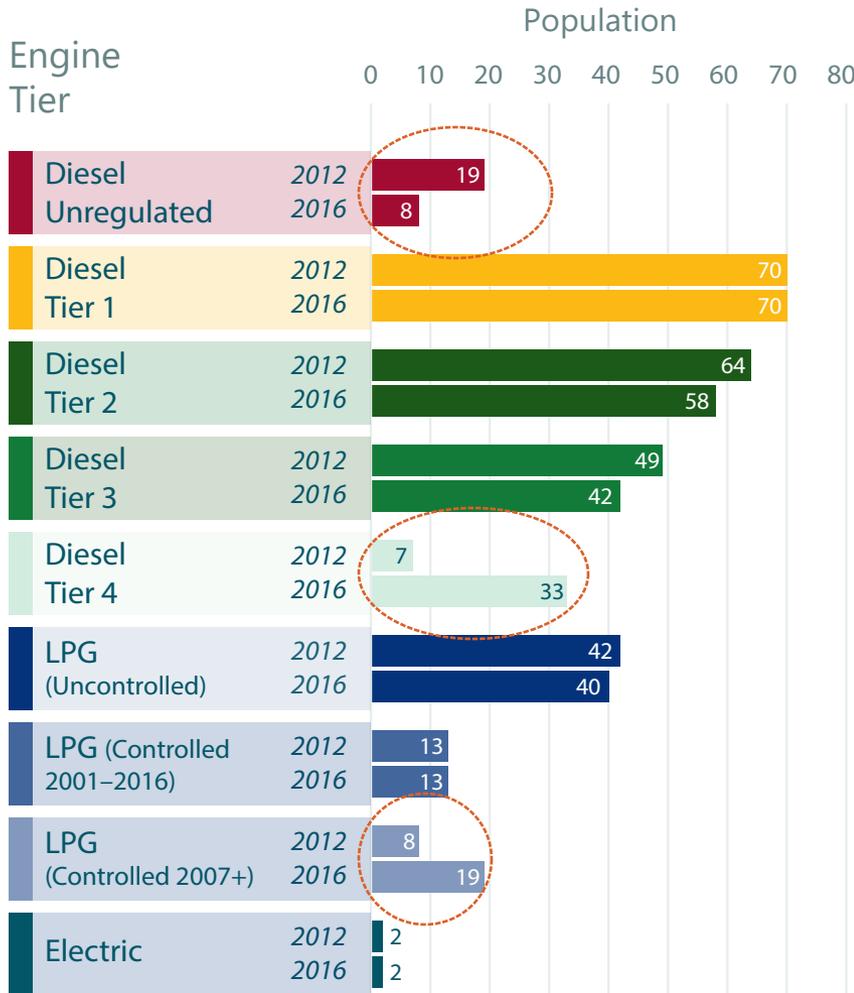


Figure 6. MDOT MPA Terminals
 Modernization of Cargo Handling Equipment
 (2012-2016)



Forklifts and Top Loaders



Total Population: 2012: 274 | 2016: 285