

(5-240322-C) Trends in Methane Emission Sources in the Los Angeles Basin, California

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Field campaigns in the summers of 2010, 2019, and 2023 measured methane (CH₄), carbon dioxide (CO₂), carbon monoxide (CO), and C₂-C₅ alkanes throughout the Los Angeles (LA) Basin aboard the NASA DC-8 and NOAA P-3 aircraft. California (CA) legislation currently requires that greenhouse gas emissions be reduced to 40% below 1990 levels by 2030, which will require knowing the sources of urban methane emissions to achieve this goal. Examining the relative emission ratios of these various alkanes and CH₄ versus CO provides valuable insight into the CH₄ contributions of different sources in the LA Basin. This analysis shows that the relative emissions of CH₄ to on- and off-road combustion sources has increased since 2010 in the LA Basin. Further, using CA Air Resources Board CO emissions alongside CH₄/CO enhancement ratios, we determine summertime CH₄ emissions from the LA Basin. This analysis shows how CH₄ sources have changed in the past 13 years, providing insight into how CA is performing on their greenhouse gas reduction goals.

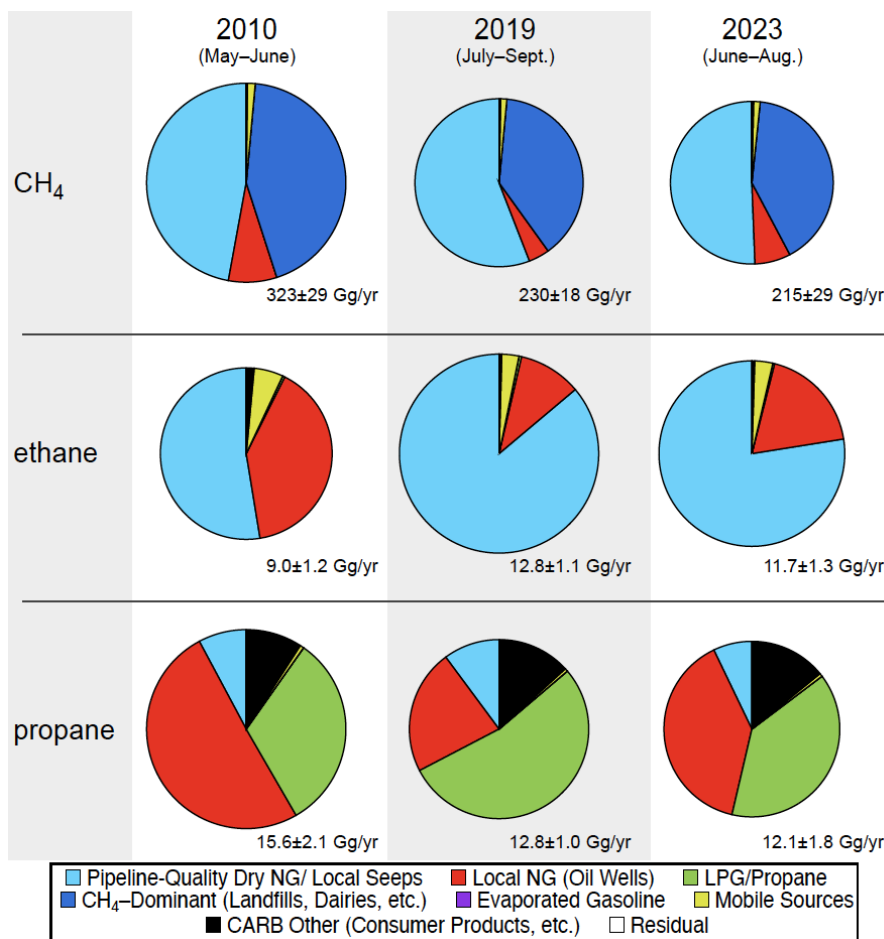


Figure 1. Results from a linear least squares solution to a combination of six emission sources and seven trace gas species in the SoCAB over three years using in-situ airborne data (2010, 2019, 2023). The pie charts for CH₄, ethane, and propane are shown here and sized relative to the largest total emissions for the three years.