

## 2019 U.S. Oil & Gas Methane Emissions Estimate

Environmental Defense Fund estimates U.S. segment-wide oil and gas methane emissions in 2019 were 16.2 million metric tons.

### Production

With the exception of the Permian, total site-level production emissions are estimated for each basin based on site-based measurements at 433 sites in six production areas (Barnett Shale, Fayetteville Shale, Marcellus Shale [Southwest PA/WV], Uintah County, Upper Green River Basin, and Weld County). Emission factors are correlated with yearly natural gas production (calculated from Enverus/DrillingInfo) and used to calculate emission totals by basin. For more details, please refer to [Alvarez et al. 2018](#). For the Permian, the leak rate found in [Zhang et al.](#) is combined with yearly gas production (from Enverus/DrillingInfo) to calculate an emissions total for that basin.

### Gathering & Boosting

Gathering station emissions are estimated from Enverus/Drillinginfo gas production and state-specific emission rates reported in [Marchese et al.](#), adjusted to better account for heavy-tail emissions.

### Processing

Nationwide processing emissions are based on [Marchese et al.](#) and the plant count from the GHGI.

### Transmission & Storage

Transmission & Storage emissions by source are taken from the GHGI, and an abnormal emissions category is added using the [Zimmerle et al.](#) estimate of 200 Mg/station/yr.

### Distribution

Nationwide distribution emissions by source are taken directly from the EPA GHGI for the relevant year, with one exception. Emissions from distribution mains in the GHGI are replaced with the value estimated by [Weller et al. 2020](#). Weller et al. found that the EPA GHGI underestimates these emissions due to underestimating the number of leaks and failing to account for the upper tail of the distribution of leaks.