



## **Improving emissions factors for estimating urban natural gas leakage**

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Emissions factors for pipeline natural gas leaks are in need of refinement. In addition to limitations from the small sample sizes of leaks that were initially used to develop emissions factors, a further limitation to emissions factors is lack of knowledge of characteristic statistical distributions of pipeline leak rates. For example, leaks were implicitly assumed to be normally distributed so that an average leak rate was used for pipelines of a given construction. Our natural gas leak data from Boston, USA, in which we found over 3,000 natural gas leaks, indicates that leaks rates are highly skewed, with relatively few leaks likely contributing disproportionately to the total. The long-tailed distribution of gas leak rates is mirrored by a similarly skewed distribution of surface methane concentrations in air. These data suggest that emissions factors should be based on correctly specified statistical distributions, and that fixing relatively few large leaks first may provide the most environmental benefit per cost.