

## Mark Keely

There is uncertainty to rely on a narrow set of bottom up estimates for methane leakage rates while leaving out top down leakage rates. It is suspect to have one and not the other. Considering the multiple locations and long distances from the wells through the pipelines to its final destination top down observations should be included in evaluating methane leakage rates because they are more comprehensive with sensors that capture the full range of operating conditions at gas extraction fields and pipelines. To leave out top down observations would be the practice of dubious legality. Regarding DSSEIS page 42, Alvarez found good agreement that a combined estimate for methane emissions to be 60% higher than US EPA emission inventory estimate.