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Compositional analytics for GHG, SOX, NOX from industrial flaring- know before you can act

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Statement of the Problem: Oil & Gas Industry and Energy sector has a prominent role to play in achieving sustainable, viable and doable GHG reduction to meet the UN Sustainable Development Goals. Approach towards establishing a rule-based quantification of GHG, SOX, NOX and other pollutants are diverse, and its accuracy is often questionable. It is also observed that regulatory approaches vary from region to region and country to country. Global data for flaring is based on Satellite Data or Company furnished date or other estimates. NOAA statement says that global flaring reporting based on Satellite passing by may not capture the flaring as some flares don't burn hot enough to be included in NOAA dataset, they may not have been burning when the satellite passed overhead, the flare may not be frequent enough to make it past the 3 detection threshold, heavy clouds may have obscured the flare from the sensor, etc. GHG, SOX, NOX can be established when composition of the flared gas is known. All other estimations will have its own errors. Even though it is widely thought that everything that is flared is GHG or pollutant; it is not true. Flared gas may contain Nitrogen, Steam, other components which are not GHG and have no negative impact on atmosphere. Also, it is a misnomer that everything is burnt in flare produces CO2 and combustion efficiency is always 100%. Combustion efficiency varies widely based on flare design, types of gas flared and many other factors which are not always reported out. Unburnt components would have different effects to atmosphere (e.g. unburnt Methane, Ethane, Propane, BTX, etc.) Industry need proven, accurate, technically feasible and commercially viable method to determine realistic GHG, SOX, NOX reporting; both in company level as well as country level. This paper provides practical insight and systematic approach in moving from current state to Best in Industry Sector and further to Best in Class in determining GHG from flaring. This method will lead to focused and system-based technology deployment and operational adjustment to avoid, minimize flaring which is auditable.