Occupational Health & Safety in Energy: SDG Adoption, Policy Strength, and Injury Performance

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Abstract:

This study explores the link between Sustainable Development Goals (SDGs) in Occupational Health and Safety (OHS) and management systems and injury performance in the energy sector. Analyzing data from 281 firms across four segments (Upstream, Midstream, Downstream, and Integrated), we measure OHS adoption using a two-item SDG count (SDG 3 and SDG 8), management systems via a Health and Safety Policy score, and injury performance with the winsorized total injury rate. Results show adoption rates of 47.3% for SDG 3 and 54.8% for SDG 8, with a mean OHS SDG count of 1.03. The average policy score is 51.35, and the mean injury rate is 1.96. Higher SDG adoption correlates with lower injury rates (all $p \leq .001$), and the policy score also negatively correlates with injuries ($r = -0.310$, $p < .001$). Policy scores vary significantly across segments (Kruskal-Wallis $\chi^2 = 48.29$, $p < .001$), though injury rates do not show significant differences ($\chi^2 = 4.69$, $p = .196$). A multivariate Ordinary Least Squares (OLS) regression indicates each additional SDG correlates with a 0.506 decrease in injury rates ($p < .001$). Full adoption of both SDGs could reduce injury rates by approximately 1.01 (52% of the sample mean), while a one-point policy score increase predicts a reduction of 1.334 ($p < .001$). In conclusion, adopting OHS-related SDGs and formal Health and Safety policies is linked to lower injury rates, with significant variation in policy implementation across value chain segments.

Keywords:

Occupational health and safety, Sustainable Development Goals (SDG3, SDG8), Injury rates, Energy value chain.