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“TEN YEARS WORKING TOGETHER FOR A SUSTAINABLE FUTURE”

A short-cut model for predicting biomethane availability after biogas upgrading

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Abstract

Biomethane figures with increasing importance in the bioenergy sector. As a renewable energy source that promotes waste recovery and GHG (greenhouse gases) reduction, biomethane use aligns with cleaner production principles. However, many of the final uses to biomethane require an upgrading and cleaning process, to remove contaminants such as H₂S and CO₂. Facing the great amount of technological options to promote biogas upgrading and cleaning up to this date, it might be a rather challenging task to have a first estimate of biomethane availability required for a conceptual project level. Thus, the main objective of this paper is to propose a short-cut, mass balance-based model to predict biomethane availability after promoting a biogas cleaning and upgrading process regardless of the source of organic feedstock or the choice of the cleaning technology. The model development results into interesting dimensionless parameters, such as the gas contamination factors. Relevant parameters regarding biomethane use, such as its LHV and Wobbe index are also adapted to this model. The correlation with data from literature shows that the model has a satisfactory prediction when methane losses in the upgrading process are less than 3%.

Keywords: *Biogas, Biomethane, Upgrading, Availability, Shortcut*