

Simulation of Biogas Upgradation to Biomethane and its Sustainability Assessment [†]

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[†] Presented at International e-Conference on Green Chemistry and Engineering towards Sustainable Development – An Industrial Perspective (16-18 June 2021), Surat, Gujarat, India

Received: 5.06.2021; Revised: 10.06.2021; Accepted: 12.06.2021; Published: 15.06.2021

Abstract: Biogas is a highly under-utilized renewable energy source having high market potential. The major reason for its underutilization includes less calorific value and a generation of other products such as H₂S. Biogas up-gradation (purification) techniques can be found in the literature that separates methane components from the biogas, thereby increasing its calorific value. The present work explores the possibility of environmental benefit or burden of biogas up-gradation. The author has simulated the water scrubbing technique for biogas' up-gradation to bio-methane using UniSim Design software. The inventory thereby generated is utilized to perform Gate to Gate Life cycle assessment to evaluate environmental impact. The functional unit for life cycle assessment is 1million calories of heat generated through biogas and biomethane. The work would form the basis of a detailed sustainability assessment aiding decision on adoption of biogas up-gradation process. The results are to be discussed in environmental impact per unit amount of heat generated.

Keywords: biogas; sustainability assessment; environment; biomethane.

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Funding

This research received no external funding.

Acknowledgments

This research has no acknowledgment.

Conflicts of Interest

The authors declare no conflict of interest.