Biogas and its opportunities—A review

Biogas production is a well-established technology primarily for the generation of renewable energy and also for the valorization of organic residues. Biogas is the end product of a biological mediated process, the so called anaerobic digestion, in which different microorganisms, follow diverse metabolic pathways to decompose the organic matter. The process has been known since ancient times and was widely applied at domestic households providing heat and power for hundreds of years. Nowadays, the biogas sector is rapidly growing and novel achievements create the foundation for constituting biogas plants as advanced bioenergy factories. In this context, the biogas plants are the basis of a circular economy concept targeting nutrients recycling, reduction of greenhouse gas emissions and biorefinery purposes. This review summarizes the current state-of-the-art and presents future perspectives related to the anaerobic digestion process for biogas production. Moreover, a historical retrospective of biogas sector from the early years of its development till its recent advancements gives an outlook of the opportunities that are opening up for process optimisation.

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Corresponding author: Kougias, P.
Contributors: Kougias, P., Angelidaki, I.
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