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ENVIRONMENTAL IMPACT ASSESSMENT OF ELECTRICITY GENERATION FROM BIOGAS IN PALESTINE

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Abstract

In Palestine, the energy situation is unique compared to other Middle Eastern Countries, as there are technical and political challenges for transporting, storing, importing and exporting energy. Actually, energy import from Israel meets the major share of Palestinian energy needs. Palestinian reliance on Israel concerning its energy supply is an issue due to the political situation. Furthermore, from an environmental point of view, Israel predominantly relies on fossil fuels for its own electricity production; therefore, renewable energy production in Palestine can represent a solution to environmental concerns. With regard to electricity (EE) generation, Anaerobic Digestion (AD) of biomass and/or Organic Fraction of Municipal Solid Waste (OFMSW) can be a particularly suitable solution when realized in small and local plants. In this study, the environmental impact of electricity generation from two Anaerobic Digestion (AD) plants in Palestine was evaluated, using the Life Cycle Assessment methodology. In both of them, the produced biogas is used to feed a CHP engine and the generated electricity is put into the grid. The first pilot plant, located in Dura (Governorate of Hebron), is fed with animal manure and other urban waste; the second is in Bethlehem and mainly fed with OFMSW. For both AD plants, the results show that: 1) the produced EE has a lower environmental impact respect to that imported from Israel, 2) the main environmental hotspots are: digestate emissions, electricity and diesel consumption and emissions from biogas combustion.

Key words: anaerobic digestion, climate change, greenhouse gases, Life Cycle Assessment, renewable energy

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