INTRODUCTION
In Palestine, energy import from Israel meets the major share of energy needs. It is an issue due to the political situation. Furthermore, Israel predominantly relies on fossil fuels for its electricity production, therefore, renewable energy production in Palestine can represent a solution also for 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 proper solution, in particular when realized in small power and local plants.

METHODS
The environmental impact of electricity generation from two AD plants in Palestine was evaluated, using the LCA methodology. The produced biogas is used to feed a CHP engine and the generated EE is put into the grid. The first plant is located at Dura (Governatorate of Hebron) and is fed with animal manure and other urban waste; the second is located in Bethlehem and is mainly fed with OFMSW. The functional unit is 1 kWh of produced electricity. The LCA study has been carried out considering a “gate to gate” approach, (i.e. only the processes that occurs at the biogas plant has been included in the system boundary.) The benefit arising from surplus heat valorization was evaluated too (e.g. greenhouse, absorption chiller, drying, etc.). The characterization factors reported by the ILCD method were used.

RESULTS
Hotspots identification

DURA

BETHELHEM

Comparison with Israel electricity mix

The produced EE has a lower environmental impact respect to that imported from Israel. The main environmental hotspots are: digestate emissions; electricity and diesel consumption and, finally, emissions from biogas combustion in the CHP.

The exploitation of surplus heat allows to offset the environmental impact for 5 of the 9 evaluated impact categories for the AD plant in Bethlehem and for 6 of the 9 evaluated impact categories for the AD plant in Dura

Acknowledgement: The Authors thank the John Paul II Foundation (Italy) for the financial support.