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## Estimated production of electrical energy for the controlled landfill in Fez (Morocco) by the US EPA Land-GEM model

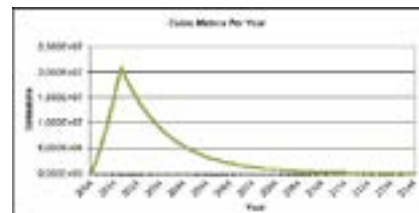
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Throughout this article, we will present, in the case of the controlled discharge of Fes which first at the national level is it, even on the level of Africa, It makes it possible to control all the effluents, while preserving the environment of the city. The discharge it is the state of the places of production of electrical energy and thermal energy by the cogeneration. The current production of household wastes in urban environment in Morocco is at 5.3 million tons a year, and in rural environment 1.47 million tons a year. With population growth, rapid urbanization and changes in consumption patterns, household waste production in Morocco is increasing. The rate of setting in controlled discharge is of 35%, this rate will have to reach 64% after the opening of several controlled discharges, which are in the course of construction [2]. Household waste in Morocco contains 65%-75% organic matter, so landfills in Morocco are one of the sources of biomass. According to the calculations of the energy potential of biomass, we can deduce that the amount of electricity that could produce by incineration of household waste from the Rabat region is about more hundred gigawatt-hours [3].

### In this study, we used several techniques of calculation and modeling:

- IBM - Software SPSS,
- Technique of calculation for waste tonnage on the level the controlled discharge of Fes,
- Software Landfill Gas Emissions Model (LandGEM) version 3.02 of the USEPA,
- Equation potential of production of electrical energy starting from the methane recovery of the discharge,
- Equation of the thermal power released by the thermal engines of generator.

We will show that the quantity of the electrical energy estimated by the methanation of household wastes of the discharge of Fes is 65.5 GWh/year, and then these quantities are currently available to the level of the discharge of Fes. This alternative allows a reduction of tonnage of accumulated waste.



### Recent Publications

1. Funds of Communal Equipment in Morocco and the World Bank, "Diagnosis of the System of Environmental Evaluation in Morocco", August 17th 2011, p.11-77
2. Delegated minister In charge of the Morocco Environment, "Current situation of waste management domestic and compared to Morocco", Organization of the 24th meeting of the National committee of the PNDM on October 2th, 2013
3. Y. Naimi, M. Saghir, A. Cherqaoui, B. Chatre, Energetic recovery of biomass in the region of Rabat, Morocco, International Journal of Hydrogen Energy, Volume 42, Issue 2, 12 January 2017, Pages 1396-1402. Lin and Yavari (2015), "Upper bound of polymeric membranes for mixed-gas CO<sub>2</sub>/CH<sub>4</sub> separations", Journal of Membrane Sci. Vol. 475, pp. 101-109

### Biography

Naimi Youssef has his expertise in the fields of renewable energies, and particularly in biomass, fuel cells, and environment. He is Full Professor at Sciences Faculty of Ben M'sik, the University of Hassan II of Casablanca. He is a Vice-President of association, The Moroccan Society for Advancement of Renewable Energy (SMADER), Coordinator of the course "Chemistry of the Environment" License Materials Science Chemistry (SMC), responsible for the Specialized Master "Renewable Energy and Material".

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