

How Waste to Energy (WTE) may help Morocco to reduce landfill greenhouse gas emissions and increase renewable energy

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Morocco is a rapidly developing country in North Africa and several of its cities are facing serious waste management problems and depend on landfilling mountains of wastes in vast open dumps. Lack of technical and financial resources have resulted in a non-sustainable urban infrastructure, which impacts the quality of life of the population. The first regulated landfill started in 2000, with lot of technical difficulties such as lack of proper leachate treatment and non-equipped to capture methane gas. Therefore, the public authorities have favored the involvement of the private sector, local and international, through public services contracts, notably Law No. 54-05 (<https://ppp.worldbank.org/public-private-partnership/library/morocco-concession-law-loi-n°-54-05-relative-la-gestion-deleguee-2006-french>). Because of this law, Morocco's municipalities have invested a lot in the collection on wastes that, generally, are taken out of the urban areas to waste dumps in the countryside, more than 15 km away; however, as urbanization reaches out to these zones, citizens living there are complaining bitterly. While recycling and source separation of recyclable is a standard practice in the west, Morocco's management of municipal solid waste (MSW) is still mired in the stage of several failed pilot project experiences, which were poorly executed. The fraction of food waste in MSW is high, at 60-70%. The population of Morocco is about 34 million, including 20 million in urban areas. The National Municipal Solid Waste Program (PNDM in French) was launched in 2008 with support of the World Bank. The required total capital investment in the PNDM is estimated at US\$1.3 billion. (<https://www.worldbank.org/en/results/2013/05/22/morocco-improving-municipal-solid-waste-management-through-development-policy-operations>).

The metropolitan city of Casablanca (6 millions inhabitants, 1.5 million tons MSW) is looking for an alternative to non-regulated landfills (saturated at 99 percent), with shortage of land for sanitary landfill and public opposition to new landfills. Also, during the last session of the UNFCCC's Conference of the Parties (COP21), Morocco announced that the renewables capacity will reach 52% of the total by 2030. Diverting MSW from landfilling to WTE would help in meeting this goal. In this dynamic, Morocco has adopted (2015) a new law of Public-Private Partnerships. Its purpose is to provide a unified framework and incentive for the development of PPPs for the benefit of the State. Municipalities will also have the legal and financial instruments necessary to develop a Waste-to-Energy infrastructure. An additional advantage of WTE is that the low pressure steam from the WTE turbine can be used to desalinate water. Morocco is facing drought that already impacted its agriculture and water supply to its citizens. Lately several desalination plants projects are in construction or under planning. WtERT-Canada and Columbia's Earth Engineering Center are collaborating on a pre-feasibility study on the economic and environmental aspects of a WTE plant to serve the city of Casablanca.