The current study aims to assess the environmental and economic performance of Refused Derived Fuel (RDF) produced from mixed Municipal Solid Waste (MSW) in Lahore. Life Cycle Assessment (LCA) was performed in Gabi software utilizing the database and primary data from the field. The MSW generation of Lahore city is 6500 t. Currently, there is no existing RDF plant in Lahore city, thus, a small-scale RDF plant was designed. Approximately 17,300 t RDF can be produced from 100 t MSW. The calorific value of RDF calculated was 14.713 MJ/kg. Attributional LCA was conducted, and ReCiPe (H) LCIA was used for modeling. LCA modeling results showed that RDF production from MSW is more eco-friendly than the existing landfilling practices with climate change 239 kg CO_2 eq, human toxicity 0.0145 kg 1,4 DB eq, ozone depletion potential 1.08E-05 kg CFC-11 eq, eutrophication potential 33.88E-03 kg P eq, acidification potential 0.25 kg SO_2 eq, and phototropic ozone formation 0.144 kg NO_x eq. To further alleviate the environmental impacts scenario modeling was conducted, in which the electricity supply is from grid mix, and global warming potential (GWP) decreases from 239 to 222 kg CO_2 eq. Hotspot identification was carried out to highlight the impacts of individual impact categories, palletization contributed 50% and shredding contributed 20% of total impacts. Economic analysis showed that 1622.46 USD/day revenue could be generated. RDF production from MSW and utilizing it as an alternative fuel is an environmentally and economically viable option for energy generation and reducing the waste sent to landfills. Furthermore, it also facilitates achieving circular economy and the UN's famous Sustainable Development Goals (SDGs).