

# RECYCLING & WASTE MANAGEMENT

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## Energy saving potential associated with recovering the waste heat of industrial plants in oman

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The power demand is facing a rapid increase and is starting to create a burden on Oman due to its unrenewable main sources of energy. Oman power production is mainly dependent on crude oil and natural gas (NG), while there is no much power produced by renewable sources as of yet. Waste heat recovery nowadays is considered to be an economic method to increase the overall efficiency of industrial plants and, thus, to lower fuel demand. The current study aimed at evaluating the energy saving potential associated with recovering the waste heat by means of an Organic Rankine Cycle (ORC) in four industrial plants in Oman. Based on the average cooling water temperature and optimum dimensionless mass flow rate the maximum energy saving potential has been achieved at Al Ghubra Power &

Desalination. In terms of fuel consumption's this equals to i) saving in crude oil consumption by 70.03 liters/day, and ii) saving in NG consumption by 68.56 m<sup>3</sup>/ day. Furthermore, the cost for the fuel purchased by the plant can be reduced down to 6.400/day Omani Rial (OR) (crude oil) and 1.600/day OR (NG). In addition, the cost of the power consumed in the plant would be decreased by 13.00 OR/day. The lower energy savings potential occurred at Areej Vegetable Oils & Derivatives. It has been concluded that the ORC technology seems to be a practical solution for converting waste heat into power in Oman for industries of high values of waste heat temperature and flow rate.

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