



# The Investigation of the Effect of Repowering Options on Electricity Generating Cost for Iran Steam Power Plants

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**Abstract:** Repowering as an experimental and generable way can be an effective method for reconstructing steam power plants. Due to the power plants specifications there are different repowering methods. In this paper overall conditions have been considered for choosing the more appropriate method. According to selected method, thermo-economical parameters of the repowered cycles for most of the Iran power plants are calculated. The repowered power plants generating electricity cost is compared with the necessary investments for establishing new gas turbine plants or combined power plant cycles. The calculations are based on similar costs for combined cycle power plants. Based on these calculations the generated electricity cost for three different scenarios: steam power plant repowering, building gas turbine plant and combined cycle power plant are calculated and compared.

**Keywords:** Repowering, Iran, Steam Power Plant, Feed Water Heating, Hot Wind box, Gas Turbine, Capital Cost

## Introduction:

Intensive request of energy in Iran and %5 increases of final capitation index of annual energy [8], motivate the energy researchers to provide creative solutions to overcome this problem and reply to this demand. At the present time, considerable increase in electrical energy demand in Iran and lack of enough reliable power, encourage the managers of electricity generator networks to provide it with more reliable and chipper ways. As most of existing power plants in Iran have reached to the end of their lifetime and considerable numbers of them do not have acceptable efficiency, therefore the selection of the best way of improving of these power plants has become a challenging problem. As a main part of the electrical power generation is produced by steam power plants, therefore the use of repowering methods can be a remedy to this problem. Repowering is broadly defined as an addition to or replacement of existing power plant equipment, retaining serviceable permitted components to improve generation economics, extend life, improve environmental performance which enhance the operability and maintainability, and more effectively use an existing site [27]. In this paper the possible repowering options for Iran's steam power plants is investigated using the available experimental data for other countries. The current condition of studied plants and practical restrictions are considered for each repowering method during the study. Iran has considerably invested in the gas turbine power plants construction during 2006-2012 [8] therefore, the cost of per kwh generated electricity in repowering options is compared with one in gas turbine power plants one. The

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