

## Thermodynamic simulation of a hybrid solid oxide fuel cell (SOFC)–Heat recovery steam generator (HRSG)–gas turbine power plants

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The fuel cell model have been used to this research work is based on SOFC which is integrated a heat recovery steam generator (HRSG) and gas turbine (GT) and a steam turbine (ST). Three possible technological approaches to suggest the desirable in the combine cycle SOFC–HRSG and gas turbine are compared. In first approach indicates the generation of the required steam in the coupled gas turbine cycle. Then involve recycling the some part of the exhaust gases around the anode of the SOFC. And the last one involves of using exhaust gases in the HRSG which drives the steam turbine by producing steam for additional power works. To achieve the more efficient conversation of the thermal energy to power output, the component design mainly HRSG and steam turbine have to be made in a great concern. And HRSG is considered as a triple pressure with reheat for the taken model. For improving the whole cycle efficiency, power output generation from both SOFC and conventional system are described as combine system. This model is simulated by the ASPEN plus software which is able to provide thermodynamic and parametric analysis.