

عنوان مقاله:

Modeling and Sizing a New CCHP System with Renewable Energy Resources

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خلاصه مقاله:

Combined cooling, heating and power (CCHP) systems have attracted lots of attention because of heat loss and energy conversion costs reduction. In order to minimize contamination and fossil fuels consumption, a new CCHP system including photovoltaic (PV) arrays, wind turbines, and solid oxide fuel cells (SOFC) as the prime movers is proposed in this paper. The optimal sizing of the system components is obtained by employing a constrained binary multi-objective particle swarm optimization (CB-MOPSO) algorithm. Following electrical load (FEL) and following thermal load (FTL) operation strategies in the CCHP system are considered simultaneously. Therefore, the system provides the heat, cold, and power demands without having to the local power grid and any auxiliary heat production system. The system can be used as off-grid in every place and time. To evaluate the renewable CCHP system performance, the fuel consumption and pollution of a traditional separated production (SP) system is evaluated and compared with the ones of the proposed CCHP system. It will be shown that the CCHP system satisfies the demands simultaneously, and significantly decreases fossil fuels consumption and pollution in comparison to SP systems.

کلمات کلیدی:

CCHP, SP, renewable, sizing, PSO

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